

2/2 007

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AA0113030

ABSTRACT/EXTRACT--(U) CP-0- ABSTRACT. SOLNS. OF BASIC AL CHLORIDES WERE  
PREPD. BY MIXING  $Al(OH)SUB3$  WITH HCL AND NEUTRALIZING THE RESULTING  
SOLN. WITH ENOUGH METALLIC AL TO GUARANTEE THE FORMATION OF  $Al SUBN (OH)$   
 $SUB3N-1$  CL, WHERE N WAS 1-3.

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UNCLASSIFIED

USSR

UDC 577.4

SHALABIN, G. V., PERVOZVANSKAYA, T. N.

"Some Problems of Optimal Planning of the Activity of Forestry Management and Logging Enterprises"

V sb. Primeneniye mat. v ekon. (Application of Mathematics in Economics -- collection of works), Vyp. 7, Leningrad, Leningrad University, 1972, pp 98-107 (from RZh-Kibernetika, No 7, Jul 72, Abstract 7V549)

No abstract

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USSR

UDC 681.3.001:518.5

PERVOZVANSKIY, A. A.

"Search"

Poisk [English version above], Moscow, Nauka Press, 1970, 264 pp (translated from Referativnyy Zhurnal Avtomatika, Telemekhanika I Vychislitel'naya Teknika, No 3, 1971, Abstract No 3 B67 K by N. V.)

Translation: This book is devoted to the problem of search for optimal solutions. After formalization of this problem as a problem of determining the extreme of a goal function, primary attention is turned to description of computational procedures of search (gradient, relaxation, random, etc.). Methods are described for overcoming difficulties related to the presence of errors, limitations, multiple extremes, and the "gully" nature of the goal function. The basic ideas of search in a finite set of versions are presented. The book is designed for a broad range of readers interested in problems of cybernetics and requires no special mathematical knowledge.

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USSR

UDC: 51:330.115

PERVOZVANSKIY, A. A.

"Automatic Control Theory as Applied to Technical Economics Problems"

Metody upr. bol'shimi sistemami. T. 1 (Methods of Controlling Large Systems. Vol 1), Irkutsk, 1970, pp 148-196 (from RZh-Kibernetika, No 7, Jul 71, Abstract No 7V629)

Translation: Extensive discussion is now in progress on the problem of the applicability of ideas and methods developed within the framework of classical automatic control theory (technical cybernetics) to the investigation of economic phenomena. There exist both the view which denies such a possibility, and the opposite view which assumes that the traditional formalism is completely transferable. This paper sets itself the task of demonstrating the inadmissibility of either concept: the paper also shows some possibilities of using the theory of automatic control for analyzing a certain class of technical and economic situations, the limitation of these possibilities, and the need for developing a new and more complex technique. Author's introduction.

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USSR

UDC 616.981.25-092.9-07:516.12-009.8-07

PERVUKHINA, N. K., Chair of Pathological Physiology, Astrakhan Medical  
Institute

"Impairment of Autonomic Innervation of the Heart in Experimental Staphy-  
lococcus Intoxication"

Moscow, Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya, No 5,  
1971, pp 64-66

Abstract: EKG shifts and the autonomic nerves of the heart were studied in animals poisoned with staphylococcal toxin. In dogs killed by intravenous injection of 0.1 to 0.15 ml of staphylococcal toxin, examination of the EKG revealed a slowing of the cardiac rate and a decrease in the amplitude of the R wave, whereas only the latter was observed in the animals that survived the poisoning. Study of the sympathetic nerves in cats poisoned with staphylococcal toxin showed decreased excitability (in response to stimulation of the central end of one of the transected vagus nerves after bilateral vagotomy), resulting in a loss of the positive ino- and chronotropic effects on the heart. On the other hand, excitability of the parasympathetic centers was increased by staphylococcal toxin. Stimulation of the central end of the vagus nerves after unilateral vagotomy lowered the threshold of excitation and intensified the negative

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USSR

PERVUKHINA, N. K., Patologicheskaya Fiziologiya i Eksperimental'naya Terapiya,  
No 5, 1971, pp 64-66

effects on the frequency and amplitude of the heart rate in intoxicated cats.  
This predominance of parasympathetic influences on the heart in staphylococcal  
intoxication may play a part in the pathogenesis of the cardiovascular dis-  
orders associated with this type of intoxication.

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USSR

UDC [537.226+537.311.33]:[537+535]

BARANOV, A. V., VOROB'YEV, G. A., PERVUKHIN, N. P., and KHOROMENKO, A. A.

"Study of the Breakdown of Silicon Monoxide Films at Constant Voltage"

Izv. Tomsk. politekhn. in-ta (News of Tomsk Polytechnical Institute), 1971,  
Vol 180, pp 84-88 (from RZh Fizika, No 12, Dec 71, Abstract No 12Yel233)

Translation: The thickness of the SiO films was  $d = 300-5000 \text{ \AA}$ . It was observed that  $E_{br}$  rises with a decrease in  $d$  and that  $E_{br}$  drops when the upper electrode is the cathode. These facts support the electrical character of the breakdown of SiO film.

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USSR

UDC 629.78.018.1

ARDASHEVA, M. M., IL'INA, S. A., LODYGIN, N. A., MAYKAPAR, G. I.,  
PERVUSHIN, G. Ye., TOLMACHEVA, K. F.

"Use of Fusible Temperature Indicators to Measure Heat Fluxes to Models in Wind Tunnels"

Uch. zap. Tsentr. Aero-gidrodinam. Inta [Scientific Writings of Central Aero-Hydrodynamics Institute], Vol 3, No 1, 1972, pp 77-82, (Translated from Referativnyy Zhurnal, Raketostroyeniye, No 4, 1972, Abstract No 4.41.171 from the Resume).

Translation: Temperature-indicating countings are widely used in studying heat transfer in aerodynamic experiments. A method is described for studying fusible heat indicators which allows the temperature and temperature interval of melting of the temperature indicators to be determined as a function of pressure and heating rate. The rate of sublimation of the temperature indicators is determined at various pressures. The use of this method has allowed the All-Union Scientific Research Institute of Luminophors and high-purity substances to develop fusible temperature indicators suitable for investigation of heat transfer to flight vehicle models. Model photographs produced in various wind tunnels are presented as examples. 7 Figures; 1 Table; 4 Biblio. Refs.

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USSR

RUBTSOV, M. I., SPORYKHIN, V. I., PERVUSHEVEKIY, V. P., MOROZOV, V. F.,  
LUTSET, B. Ya., SHCHUKIN, L. I.

"Impulse Gas-Discharge Light Source"

Otkrytiya Izobreteniya Promyshlennye Obrazts Tovarnye Znaki, No 31, 1972,  
Patent No 355694.

Translation: 1. An impulse gas-discharge light source with an optically transparent tubular bulb, within which are a dielectric plate, used to elongate the discharge channel and electrode units assembled on one side of the bulb and separated by the plate, differing in that in order to increase the evenness of radiation in the plane perpendicular to the axis of the tube, increase the electrical breakdown resistance and limiting electrical loads on the discharge device, the dielectric plate is bent into a screw shape in the zone of the discharge, forming bifillar spiral channels with its two large edges, connected together by a channel, while the two small edges are hermetically sealed to the inside of the bulb, thus limiting the discharge channel.

2. A light source according to Claim 1, differing in that in order to increase the stability to the effects of mechanical loads, the electrodes are made as truncated cones, compressed against the side surface of the bulb wall.

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USSR

RUBTSOV, M. I., SPORYKHIN, V. I., ET. AL., Otkrytiya Izobreteniya Promyshlennye Obraztsy Tovarnyye Znaki, No 5, 1972, Patent No 355694.



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USSR

UDC: 536.24:532.526

NIKOL'SKIY, Yu. V., PERVUSHIN, G. Ye., CHERNIKOVA, L. G.

"Experimental Investigation of Heat Transfer on Spheres and Thin Cones in a Hyper-sonic Rarefied Gas Flow"

Uch. zap. Tsentr. aerogidrodinam. in-ta (Scientific Notes of the Central Aerohydrodynamic Institute), 1970, 1, No 1, pp 71-77 (from EZh-Mekhanika, No 9, Sep 70, Abstract No 9B832)

Translation: The paper is dedicated to experimental investigation of heat transfer on spheres and thin cones at a zero angle of attack. The study was done in a vacuum wind tunnel at Mach numbers of 4.9-9.5 and Reynolds numbers  $R_0 = 35-1$  for spheres and  $R_0 = 100-4$  for cones, which corresponds to the region of transition between free molecular flow and the flow of a continuous medium. Use was made of the method of measurements of the overall heat flux in the steady state with compensation of heat losses in the holder and independent measurement of the radiant heat flux. The resultant data are compared with the results of theoretical calculation. Resumé.

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1/2 016 UNCLASSIFIED PROCESSING DATE 20NOV70  
TITLE--QUASICLASSICAL APPROXIMATION IN QUANTUM FIELD THEORY WITH THE  
STATIC NUCLEON -U-  
AUTHOR--(02)-BARBASHOV, B.M., PERVUSHIN, V.N. P  
COUNTRY OF INFO--USSR  
SOURCE--TEORETICHESKAYA I MATEMATICHESKAYA FIZIKA, 1970, VOL 3, NR 3, PP  
320-325  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--QUANTUM FIELD THEORY, NUCLEON INTERACTION, MESON INTERACTION,  
NUCLEAR PHYSICS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--2000/1251 STEP NO--UR/0696/70/003/003/0320/0325  
CIRC ACCESSION NO--AP0124902  
UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0124902

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FUNCTIONAL INTEGRATION TECHNIQUE IS USED FOR THE SOLUTION OF THE SCATTERING PROBLEM IN QUANTUM FIELD THEORY WITH THE STATIC NUCLEON AND CHARGED MESONS, UNDER THE CONDITION THAT THE CONSTANT  $H-G$  IS SMALL. IN THE SAME QUASICLASSICAL APPROXIMATION DISENTANGLING OF THE  $\tau$  SUBI MATRICES IS PERFORMED. THE SOLUTION IS REPRESENTED IN THE FORM OF A CERTAIN MAIN TERM PROPORTIONAL TO THE LARGE CONSTANT  $G \text{ PRIME}^2 - H$  PLUS THE CORRECTIONS TO THIS TERM WITH THE RESPECT TO  $H-G$ . FACILITY: OBYEDINENYY INSTITUT YADERNYKH ISSLEDOVANIY.

UNCLASSIFIED

USSR

UDC 621.81:539.4

BONDAR', G. G., PUKIN, B. YU., PERVUSHIN, YU. S.

"Study of the Fatigue Characteristics of the Strip and Wire Materials of Flexible Hoses"

Tr. Ufa. aviats. in-ta (Works of the Ufa Aviation Institute), 1971, vyp. 32, pp 121-126 (from RZh--Mekhanika, No 6, Jun 73, Abstract No 6V892)

Translation: A study was made of the fatigue strength of strip and wire materials of flexible metal hoses. Tests were run on specimens of Kh18N10T steel  $150 \times 10 \times 0.8$  mm cut out along the generatrix from tubular billets of metal hoses. The tests on the specimens for cyclic bending were run on the DP-5/3 unit. The results of the tests were processed statically by the least squares method and represented in the form of a graph expressing the relation of the scale of the total deformation during bending of a plate to the number of cycles before rupture. It is pointed out that the presence of welds in a number of the structural designs of the metal hoses required additional investigation of the fatigue strength of the roll weld. The tests were performed on a lot of specimens numbering 30 by the procedure described above for flat specimens. The test results demonstrated the correctness of the preceding relations for the case of multiple bending of a specimen with a weld. The test results for the plates with preliminary ironing indicate that during repeated static deformation with

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BONDAR', G. G., Tr. Ufim. aviats. in-ta, 1971, vyp. 32, pp 121-126

given deformation amplitude ( $\epsilon = 1.6\%$ ), work hardening does not promote an increase in the cyclic strength of Kh18N10T steel.

The bending strength testing of wires used to manufacture braid were run by the adopted procedure in the maximum relative deformation range of  $\epsilon = 0.009-0.07$ . The test results are represented in the form of graphs from which it is obvious that the nature of the function  $N = f(\epsilon)$  has the same form as for plates. It is pointed out that the results obtained can be used when planning and designing metal and polyvinyl flouride hoses.

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P  
Ion Exchange

UDC: 541.1238/.9

USSR

GOL'DANSKIY, V. I., Corresponding Member Academy of Sciences USSR, LEVIN B. M., MOKRUSHIN, A. D., KALIKO, M. A., and PERVUSHINA, M. N., Institute of Chemical Physics, Moscow, Academy of Sciences USSR, All-Union Scientific Research Institute of Oil Refining, Ministry of Petroleum USSR

"Effect of the Chemical State of the Surface on Annihilation Characteristics of Positronium in Porous Systems"

Moscow, Doklady Akademii Nauk, SSSR, Vol 191, No 4, Apr 70, pp 855-858

Abstract: The authors studied annihilation of positronium atoms localized in the pores of medium porous samples of silica gel, alumina and aluminum-silicon catalyst in an attempt to develop a method for determination of the volume and surface of the pores, since in such pores positronium exists much longer. The life span of positronium was measured by observing delayed coincidence of one of the annihilating  $\gamma$ -quanta and the nuclear  $\gamma$ -quantum in series with the positron which yielded a time tag for the emission of a positron by the  $\text{Na}^{22}$  source. Because of instrumental limitation the  $\tau_2$  component of the time spectrum could not be determined. Only

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USSR

GOL'DANSKIY V. I., et al, Doklady Akademii Nauk, SSSR, Vol 191, No 4, Apr 70, pp 855-858

the characteristics of the longest component connected with the loss of positronium atoms could be obtained -- average life span ( $\tau_3$ ) and intensity ( $I_2$ ).

At the pressure  $p=p_s$  (pressure of saturated water vapor at room temperature)  $\tau_3$  was absent and  $I_2$  was zero. In the range  $p/p_s=1-0.3$   $I_2$  increases sharply while  $\tau_3$  remains quite unchanged. At pressures  $p/p_s < 0.3$  the situation becomes different. In the case of the aluminum-silicone catalyst there occurs a strong quenching of positronium and along with  $\tau_3$  time a drop in  $I_2$  occurs with the decrease of  $p/p_s$ . No quenching of positronium occurs in silica gel while only slight quenching occurs in alumina accompanied by a small change in  $I_2$ . A relationship exists between the strength of Bronsted acid centers and the changes in  $\tau_3$  and  $I_2$ .

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USSR

UDC 621.45.01

PERVYSHIN, N. V.

"Determination of the Afterburner Gas Temperature of Bypass Turbofan and Turbo-Jet Engines Insuring Minimum Specific Fuel Consumption"

Kazan', Izvestiya Vysshikh Uchebnykh Zavedeniy -- Aviatsionnaya Tekhnika, No 1, 1971, pp 69-77

Abstract: Analytical relations are derived to determine the afterburner gas temperatures corresponding to minimum specific fuel consumption in bypass turbofan and turbojet engines. The optimal gas temperatures in TRDF and DTRDF afterburners are compared. Expressions for thrust and fuel consumption of bypass turbofan and turbojet engines with afterburners, the equations for afterburner gas temperatures corresponding to minimum specific fuel consumption and the effect of flight speed and engine parameters on the optimal value of the afterburner gas temperature are considered.

At high flight speeds the minimum specific fuel consumption of bypass turbofan and turbojet engines occurs under afterburner conditions. For turbojet engines the afterburner conditions become more economical by comparison with nonafterburner conditions at high flight speeds than they do for bypass

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PERVYSHIN, N. V., Izvestiya Vysshikh Uchebnykh Zavedeniy -- Aviatsionnaya Tekhnika, No 1, 1971, pp 69-77

turbofan engines. At identical flight speeds and with identical parameters of the operating cycle, the optimal afterburner gas temperatures are significantly lower in turbojet engines than in bypass engines.

Turbine and Engine Design

USSR

UDC 621.45.01

PERVYSHIN, N. V., KUCHINSKAYA, T. P.

"Concerning the Selection of a Design Point on the Fan  
Characteristic of a Ducted-Fan Turbojet Engine With High Bypass"

Kazan', Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya  
Tekhnika, No 3, 1970, pp 63-68

Abstract: The article deals with some features of ducted-fan turbojet engines with high bypass. It is shown that increasing the bypass brings about a greater drop in the relative thrust with respect to flight velocity. The influence of this drop in relative thrust upon the temperature level of the gas before the turbine, under cruising conditions, is considered. Recommendations are given concerning selection of the position of the point of combined work on the characteristic of a fan in a take-off regime, which provides for the required value of the nominal altitude thrust. 6 figures..

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USSR

UDC 631.811:631.589.2:541.183.12

SOLDATOV, V. S., ~~PERYSHKINA, N. G.~~, KHOROSHKO, R. P.,  
SUDARIKOVA, N. I., Institute of General and Inorganic Chemistry,  
Academy of Sciences Belorussian SSR, Minsk

"Ionite-Base Synthetic Nutrient Media for Plant Growth.  
Communication III. Methods of Regenerating Ionite Substrate"

Moscow, Agrokimiya, No 12, Dec 71, pp 86-91

Abstract: Analysis of substrata after 5-7 vegetation cycles indicates nearly complete depletion of potassium and partial depletion of nitrogen. Earlier research points to a theoretical possibility of producing artificial ionite-base media for plant cultivation. Detailed here are two new experimental procedures involving rapid regeneration of depleted substrata and restoration of productivity. The first method specifies individual additions of potassium and nitrogen in the form of potassium hydroxide and nitric acid in amounts equivalent to the deficit of the appropriate element. The second method involves the treatment of soil with a diluted solution of potassium nitrate containing  
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USSR

SOLDATOV, V. S., et al, Agrokimiya, No 12, Dec 71, pp 86-91

both basic regenerated ions in the form of a neutral salt. Preference is given to the second variant since it places no stringent requirements on dosage additives or thorough mixing of the soil. Subsequent treatment of the substrates with H<sub>2</sub>O<sub>2</sub> solutions to inactivate the plant metabolites and increase the soil's productivity is suggested. The optimum H<sub>2</sub>O<sub>2</sub> concentration is cited as 0.2% (27 ml of 30% H<sub>2</sub>O<sub>2</sub> per 1 kg of dry soil). Higher concentrations are said to have adverse effects on the plants. (2 tables, 3 biblio. references)

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1/2 039 UNCLASSIFIED PROCESSING DATE--0200T70  
TITLE--CREEP OF LINEAR UNORIENTED POLYMERS DURING ELONGATION, COMPRESSION,  
AND TORSION -U-  
AUTHOR--(04)-BORSENKO, V.N., PESCHANSKAYA, N.N., SINANI, A.B., STEPANOV,  
V.A.  
COUNTRY OF INFO--USSR  
SOURCE--MEKH. POLIM. 1970, 6(1) 24-8  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY, MATERIALS, PHYSICS  
TOPIC TAGS--LINEAR POLYMER, ELONGATION, CREEP, POLYMETHYLMETHACRYLATE,  
POLYSTYRENE RESIN, POLYETHYLENE, LOW TEMPERATURE EFFECT, COMPRESSIVE  
STRESS, TORSION STRESS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1992/0327 STEP NO--UR/0374/70/006/001/0024/0028  
CIRC ACCESSION NO--AP0111521  
UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0111521

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELONGATION CREEP RATES OF POLY(METHACRYLATE) BETWEEN MINUS 50DEGREES AND PLUS 70DEGREES ARE ONLY APPROX. TWICE AS LARGE AS THE COMPRESSION AND TORSIONAL CREEP RATES; BELOW MINUS 100DEGREES THE ELONGATION CREEP RATES GREATLY EXCEED THE COMPRESSION AND TORSIONAL CREEP RATES. SIMILAR SITUATIONS EXIST FOR POLYSTYRENE AND POLYETHYLENE, BUT THE 3 CREEP CURVES NEARLY COINCIDE IN THE 60-70DEGREES RANGE FOR POLYSTYRENE AND BELOW MINUS 140DEGREES FOR POLYETHYLENE.

UNCLASSIFIED



1/2 039 UNCLASSIFIED PROCESSING DATE--02 OCT 70  
TITLE--CREEP OF LINEAR UNORIENTED POLYMERS DURING ELONGATION, COMPRESSION,  
AND TORSION -U-  
AUTHOR--(04)-HORSENKO, V.N., PESCHANSKAYA, N.N., SINANI, A.B., STEPANOV,  
V.A.  
COUNTRY OF INFO--USSR  
SOURCE--MEKH. POLIM. 1970, 6(1) 24-8  
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, MATERIALS, PHYSICS

TOPIC TAGS--LINEAR POLYMER, ELONGATION, CREEP, POLYMETHYLMETHACRYLATE,  
POLYSTYRENE RESIN, POLYETHYLENE, LOW TEMPERATURE EFFECT, COMPRESSIVE  
STRESS, TORSION STRESS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/0327

STEP NO--UR/0374/70/006/001/0024/0028

CIRC ACCESSION NO--AP0111521

UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0111521

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELONGATION CREEP RATES OF POLY(ME METHACRYLATE) BETWEEN MINUS 50DEGREES AND PLUS 70DEGREES ARE ONLY APPROX. TWICE AS LARGE AS THE COMPRESSION AND TORSIONAL CREEP RATES; BELOW MINUS 100DEGREES THE ELONGATION CREEP RATES GREATLY EXCEED THE COMPRESSION AND TORSIONAL CREEP RATES. SIMILAR SITUATIONS EXIST FOR POLYSTYRENE AND POLYETHYLENE, BUT THE 3 CREEP CURVES NEARLY COINCIDE IN THE 60-70DEGREES RANGE FOR POLYSTYRENE AND BELOW MINUS 140DEGREES FOR POLYETHYLENE.

UNCLASSIFIED

1/2 035 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--EFFECT OF MEDIA ON THE FORMATION AND PHYSICOMECHANICAL PROPERTIES  
OF POLYPROPYLENE COATINGS -U-  
AUTHOR--BELYI, V.A., PESCHANYI, G.G. P  
COUNTRY OF INFO--USSR  
SOURCE--LAKOKRASOCH. MATER. IKH PRIMEN. 1970 (1) 37-40  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--PLASTIC COATING, PHYSICAL CHEMISTRY PROPERTY, MOLECULAR  
STRUCTURE, OXIDATION, TENSILE STRENGTH, HARDNESS, POLYPROPYLENE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1989/0551 STEP NO--UR/0303/70/000/001/0037/0040  
CIRC ACCESSION NO--AP0107156  
UNCLASSIFIED

2/2 035

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0107156

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. POLYPROPYLENE (I) COATINGS WERE FORMED BY SPRAYING ITS MELT ONTO METAL PLATES. THE EFFECT WAS STUDIED OF THE SURROUNDING MEDIUM ON THE TENSILE STRENGTH AT BREAK (SIGMA), HARDNESS (H), MOL. WT. (M), AND STRUCTURE OF THE FILMS (MEDIUM, SIGMA IN KG-CM PRIME2, H IN KG-MM PRIME2, M GIVEN): AIR, 80-97, 4.3-4.8, 6 TIMES 10 PRIME4; CO SUB2, 140-55, 5.6, 6.1, 10 TIMES 10 PRIME4; AR, 165-86, 5.7-6.1, 11 TIMES 10 PRIME4. THE FOREGOING RESULTS WERE OBTAINED WHEN I FILMS WERE COOLED AFTER SPRAYING AT SIMILAR TO 10DEGREES-MIN RATE IN AIR, CO SUB2, OR AR, RESP. HOWEVER, WHEN THE FILMS WERE COOLED IN WATER AT SIMILAR TO 150DEGREES-MIN RATE SIGMA OF THE FILMS FORMED IN THE AIR, CO SUB2, OR AR INCREASED TO 155-65, 180-200, OR 200-20 KG-CM PRIME2, RESP. ALSO, THE M WAS INCREASED TO 85 TIMES 10 PRIME3, 107 TIMES 10 PRIME3, OR 120 TIMES 10 PRIME3 IN THE AIR, CO SUB2, OR AR, RESP. THE STRUCTURE OF I FILMS DID NOT DEPEND ON THE MEDIUM, BUT COOLING IN WATER GAVE A FINER GLOBULAR STRUCTURE, WHICH RESISTS THERMAL OXIDN.

UNCLASSIFIED

PESHCHANSKAYA, L. G.

JPRS 55919  
8 May 1972

UDC 534.12-8

ULTRASONIC SPECTROSCOPY OF LIQUIDS

(Article by L.G. Peshchanskaya and L.G. Teshchenko, Chair of Physics,  
Moscow, Institute of Physical Sciences, USSR Academy of Sciences,  
No 1, 1972, signed to press 18 October 1971, pp 191-200)

The construction of a general theory of the liquid state of matter is a most important problem of modern physics. Up to this time there has been no such theory, and for its creation the accumulation of diverse experimental information concerning the structure of liquids is necessary, which, in turn, is no less urgent also for the solution of many practical problems.

Various physical methods of investigating these media exist (optical spectroscopy, NMR [nuclear magnetic resonance], EPR [electronic paramagnetic resonance], and others), among which ultrasonic methods occupy a definite place [reference 5]. The basic information quantities in this case are the speed  $c$  of the propagation of acoustic waves (sound waves) and their absorption  $\alpha$ .

In performing an investigation of the basic acoustic parameters in the region of ultrasonic and hypersonic frequencies (10<sup>3</sup>-10<sup>10</sup> hertz), i.e., operating on long waves comparable with

1/2 015 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--DIALKYLAMIDOTETRAIODOPHOSPHORANES -U-  
AUTHOR-(C3)-FESHCHENKO, N.G., KOVALEVA, T.V., KIRSANOV, A.V.  
COUNTRY OF INFO--USSR  
SOURCE--AH. DSSHCH. KHIM. 1970, 40(2) 500  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--IODINATED ORGANIC COMPOUND, ORGANIC PHOSPHORUS COMPOUND,  
LITHIUM COMPOUND, ORGANIC NITROGEN COMPOUND  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REFL/FRAME--1992/1571 STEP NO--UR/0079/70/046/002/0500/0500  
CIRC ACCESSION NO--AP0112565  
UNCLASSIFIED

2/2 015

UNCLASSIFIED

PROCESSING DATE--02JCT70

CIRC ACCESSION N)--AP0112565

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REACTION OF LII WITH R SUB2 NPCL SUB2 GAVE NOT THE EXPECTED R SUB2 NPI SUB2, BUT PREVIOUSLY UNKNOWN R SUB2 NPI SUB4 (R EQUALS ME, M. 121-20DEGREES; R EQUALS ET, M. 104-50DEGREES) ALONG WITH (R SUB2 NPI) SUB2 .6LICL, WHICH WERE YELLOW SOLIDS, M. LARGER THAN 250DEGREES, SOL. ONLY IN H SUB2 O, AND SLOWLY DECOMP. IN MOIST AIR. IN C SUB6 H SUB6 THESE ADDED 1 OR 3 MOLES IODINE TO FORM EITHER UP TO 90PERCENT (R SUB2 NPI SUB2) SUB2 .3.TCL OR 67PERCENT (R SUB2 NPI SUB4) SUB2 .3LICL, WHICH ARE BROWN SOLIDS, M. LARGER THAN 250DEGREES, AND DECOMP. AND DISSOLVED IN H SUB2 O. EVIDENTLY THE ORIGINAL REACTION OF 3R SUB2 NPCL SUB2 WITH 6 LII YIELDS 6 LICL AND 3R SUB2 N-PI SUB2, WHICH DISPROPORTIONATE INTO THE 2 PRODUCT TYPES SHOWN OWING TO INCREASING NUCLEOPHILICITY OF P CAUSED BY THE R SUB2 N GROUP. R SUB2 NPI SUB4 ARE ORANGE SOLIDS, SOL. IN CCL SUB4 AND C SUB6 H SUB6 ARE EASILY HYDROLYZED IN MOIST AIR; THEY CAN BE TITRATED, CONSUMING 5 EQUIVS. OF BASE.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--02JCT70  
TITLE--CLINICO EPIDEMIOLOGICAL CHARACTERISTICS OF THE SEQUELAE OF EPIDEMIC  
HEPATITIS -U-  
AUTHOR-(03)-SHLYAKHTENKO, L.I., KANEVSKAYA, M.G., PESHERSTNYAK, T.B.  
COUNTRY OF INFO--USSR  
SOURCE--ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII 1970, NR 3,  
PP 55-60  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--EPIDEMIOLOGY, HEPATITIS  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1990/1486 STEP NO--UR/0016/70/000/003/0055/0060  
CIRC ACCESSION NO--AP0109546  
UNCLASSIFIED



2/2 019

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0109546

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS PRESENT THE RESULTS OF CLINIC EPIDEMIOLOGICAL STUDY OF 388 HEPATITIS CONVALESCENTS WHO WERE OBSERVED ON A DISPENSARY LEVEL IN THE OFFICES OF INFECTIOUS DISEASES AT POLYCLINICS. THE MINIMAL 6 MONTH PERIOD DISPENSARIZATION OF PERSONS WHO RECOVERED FROM HEPATITIS WAS ADEQUATE FOR 44.7PERCENT OF CONVALESCENTS; THE REST REQUIRED MORE PROLONGED OBSERVATION PROTRACTED FORM OF HEPATITIS (IN SPECIFIC SYMPTOMS OF THE DISEASE PERSISTED UP TO 6 MONTHS) WAS DETECTED IN 7.2PERCENT OF THE PATIENTS, CHRONIC (WITH THE DURATION OF THE DISEASE 3 YEARS, WHICH WAS THE OBSERVATION PERIOD) IN 4.6PERCENT. PATIENTS SUFFERING FROM PROTRACTED AND CHRONIC FORMS OF HEPATITIS CAN SERVE AS ACTIVE SOURCES OF INFECTION. OBSERVATION ON A DISPENSARY LEVEL OF PERSONS WHO SUSTAINED HEPATITIS NOT ONLY PREVENTED ITS CHANGE TO CHRONIC FORM, BUT ALSO LIMITED THE SPREAD OF INFECTION.

UNCLASSIFIED

PESHCHEVITSKIY, B. I.

KINETICS AND MECHANISM OF REACTIONS OF COMPLEX COMPOUNDS  
(Symposium in Novosibirsk)

[Article by Doctor of Chemical Sciences B. I. Peshchevitskiy;  
Moscow, Vestnik Akademii Nauk SSSR, Russian, Vol 41, No 10,  
October 1971, pp 103-105]

In the last decade the study of the kinetics and mechanism of transformations of complex compounds has acquired paramount importance in coordination chemistry. The number of works in that area is growing in a geometric progression, and a tendency toward generalizations and theoretical explanation of the accumulated experimental material is beginning to appear. The heightened interest in complex compounds has been evoked by the broad possibilities of creating technological processes new in principle on the basis of them.

On 24-28 May, in Novosibirsk, was held the Second All-Union Symposium on the Kinetics and Mechanism of Reactions of Complex Compounds, organized by the Institute of Inorganic Chemistry of the Siberian Department of the AS USSR. Participating in its work were 160 representatives of 20 scientific research institutions of the country.

Much interest was aroused by the survey report of K. B. Yezimitskiy on "the kinetics and mechanism of homogeneous catalytic redox processes." In it it was shown that redox reactions with transfer of a single electron have three stages: the formation of a "primary" complex, electron transfer with the formation of a "subsequent" complex and decomposition of the "subsequent" complex. Having formulated the conditions for the formation of the "primary" complex, the author pointed out the special role of symmetry of the interacting orbitals. On that basis a classification of oxidizing agents was proposed: d -- oxidizing and reducing agents, and s, p -- oxidizing and reducing agents. Use of the method of graphs permits classifying the mechanisms

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SPRS 54678  
10 Dec 1971

Acc. Nr: AF0100219

Ref. Code: UR 0289

PRIMARY SOURCE: Izvestiya Sibirskogo Otdeleniya Akademii Nauk  
SSSR, No 2, Seriya Khimicheskikh Nauk, 1970,  
Nr 1, pp 39-44

L. K. Chuchalin, Z. A. Grankina,  
S. P. Khranenko, B. I. Peshchevitskiy

INFRA-RED STUDY OF THE COMPOSITION AND STRUCTURE  
OF HYDROXONIUM ION COMPOUNDS FORMED BY THE EXTRACTION  
OF STRONG MINERAL ACIDS WITH TRI-*n*-BUTYL PHOSPHATE

Infra-red investigation of the solvates of hydroxonium ion formed by the extraction of  $\text{HCl}$  and  $\text{HClO}_4$  with tri-*n*-butyl phosphate (TBP) has been made. Solvates  $[\text{H}_3\text{O} \cdot 3\text{H}_2\text{O}]_{\text{aq.solv}}^+$ ,  $[\text{H}_3\text{O} \cdot 2\text{H}_2\text{O} \cdot \text{TBP}]_{\text{solv}}^+$ ,  $[\text{H}_3\text{O} \cdot \text{H}_2\text{O} \cdot 2\text{TBP}]_{\text{solv}}^+$ ,  $[\text{H}_3\text{O} \cdot 3\text{TBP}]_{\text{aq}}^+$ ,  $[\text{H}_3\text{O} \cdot 2\text{H}_2\text{O} \cdot \text{TBP}]^+$  have been found in extracts of  $\text{HCl}$  and solvates  $[\text{H}_3\text{O} \cdot 3\text{H}_2\text{O}]_{\text{aq.solv}}^+$ ,  $[\text{H}_3\text{O} \cdot 2\text{H}_2\text{O} \cdot \text{TBP}]_{\text{solv}}^+$ ,  $[\text{H}_3\text{O} \cdot \text{H}_2\text{O} \cdot 2\text{TBP}]^+$ ,  $[\text{H}_3\text{O}^+ \cdot \text{H}_2\text{O} \cdot \text{TBP} \cdot \text{ClO}_4^-]$  in extracts of perchloric acid. With increase of acid concentration in organic phase, each preceeding form turns into subsequent one.

REEL/FRA  
19841609

72c

USSR

UDC 548.4

MINTS, R. I., KORTOV, V. S., MELEKHIN, V. P., KISLITSIN, Ye. A.,  
PLEKHANOVA, E. A., and PESHCHIN, G. F., Ural Polytechnic Institute  
imeni S. M. Kirov

"Effect of Deformation on Electron Work Function and Exoemission From  
Surface of Noble Metals"

Tomsk, Izvestiya Vysshikh Uchebnykh Zavedeniy -- Fizika, No 7, 1970,  
pp 37-42

Abstract: The article describes results of a study of regularities in the exoemission effect in the deformation of noble metals (silver, gold, platinum, and palladium). Changes in the electron work function and exoelectronic emission of the metals were studied under various types of deformation (tension, grinding, polishing). The electron work function was studied by measuring the contact potential difference by the dynamic capacitor method. The results indicate that plastic deformation due to surface tension and machining is accompanied by a decrease in the electron work function. This means that there is a

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USSR

MINTS, R. I., et al., Izvestiya Vysshikh Uchebnykh Zavedeniy --  
Fizika, No 7, 1970, pp 37-42

decline in the potential barrier value and an increase in the probability of electron emission. This effect manifests itself in the appearance of exoelectronic emission, the intensity of which depends on the degree of deformation. Simultaneous measurement of these quantities makes it possible to establish the interrelationship between the changes observed in the surface electric properties and disturbance of the surface structure and the physicochemical processes initiated by deformation.

2/2

USSR

UDC: 621.396.677.8.012.12

PESHEKHONOV, V.G.

"Directional Characteristics of a Mirror Antenna Which Receives Wide-Band Noise Emission"

Moscow, Radiotekhnika i Elektronika, Vol 15, No 12, Dec 70, pp 2607-2610

Abstract: The author studies the directional characteristics of a mirror antenna in the region of large angles  $\theta$  where  $\theta$  is the angular coordinate of the point of observation reckoned from the direction of the maximum of the main lobe. This corresponds to the region of irregular lobes of the radiation pattern. It was experimentally found that there are no zero dips in the directional characteristics even when the passband of the high-frequency filter is narrow. With an increase in  $\theta$  there is an appreciable increase in "blurring" of the characteristics. It was found that the relationship between variance of the directional characteristics and  $\theta$  calculated theoretically agrees satisfactorily with experimental data. The author thanks V.D. Kudritskiy and V.S. Shuvayev for taking part in the experiment.

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1/2 012  
UNCLASSIFIED  
TITLE--VITAMIN B SUB12 CONTENT IN THE HUMAN MILK -U- PROCESSING DATE--18SEP70  
AUTHOR--(05)-DUMA, KH., VASKOV, B., PETKOV, G., PESHEVA, V., PETKOV, K.  
COUNTRY OF INFO--USSR  
SOURCE--VOPROSY PITANIYA, 1970, NR 2, PP 54-57  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--VITAMIN B COMPLEX, ESCHERICHIA COLI, FOOD CHEMISTRY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1985/1640  
CIRC ACCESSION NO--AP0101695  
STEP NO--UR/0244/70/000/002/0054/0057  
UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0101695

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MILK OF 22 PARTURIENT WOMEN WAS ANALYZED STARTING FROM THE FIRST TILL THE SEVENTH LACTATION DAY. THE MILK WAS TAKEN EVERY DAY AT 9 A. M. N. V. BAKUNIN'S MICROBIOLOGICAL METHOD, AS MODIFIED BY LOGANOVSKY WAS USED TO DETERMINE THE VITAMIN B SUB12 CONTENT WITH THE AID OF ESCHERIHIA COLI, 113-3. AT THE TIME OF INVESTIGATION THE VITAMIN B SUB12 CONCENTRATION LEVEL TENDED TO DECLINE FROM 0.515 MUG. THE FIRST DOWN TO 0.252 MUG ON THE SEVENTH DAY. INDIVIDUAL FLUCTUATIONS OF THE VITAMIN CONCENTRATION WERE RECORDED. IT WAS LOW IN THE MILK OF PARTURIENT WOMEN WHOSE NUTRITION HAPPENED TO BE PROTEIN DEFICIENT AT THE TIME OF GESTATION.

UNCLASSIFIED



USSR

Alkaloids

UDC 615.31.547.94].074

PESHKO, D. E., and STAROBINETS, G. L., Belorussian State University  
Imeni V. I. Lenin, Minsk

"The Substoichiometric Variant of the Extraction-Photometric Method  
for Determination of Alkaloids With Methyl Orange"

Moscow, Farmatsiya, Vol 19, No 6, Nov-Dec 70, pp 60-63

Abstract: Studying the systems aqueous solution of alkaloids and methyl orange - chloroform it has been shown that substoichiometric determination of alkaloids overcomes the main deficiency of the stoichiometric method -- its lack of specificity. The substoichiometric method offers clear differentiation of individual alkaloids. Statistical treatment of the results obtained on model compounds shows that the precision of this method increases with the alkaloid-dye complexing constant.

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UDC 546.46:629.7.036  
GORBUNOV, G. M., PESHKOV, A. V., KHRISTOFOROV, I. L., and  
EMAIL', M. V.

"Investigation of the Turbulence Intensity in the Region of  
Inflow of Secondary Air Jets Into a Gas Turbine Combustion  
Chamber"

Kazan', IVUZ Aviatsionnaya Tekhnika, No 4, 1971, pp 38-43

Abstract : The intensity of the turbulent mixing process by in-  
flow of a system of round jets into the drifting flow is deter-  
mined not only by parameters of the jet and the depth of its pe-  
netration but to a considerable extent also by the turbulence in-  
duced by the jet wake. Experimental results of measuring turbulen-  
ce intensity in the inflow region of a single jet into the drif-  
ting flow and behind jets of secondary air in the combustion cham-  
ber of a gas turbine engine are presented. The measurements were  
made with the electro-hot-wire anemometer ETA-5A, of P. V. Cheby-  
shev's design. The experiments demonstrated that by the use of  
cross jets with optimum relative pitch of holes ( by specific  
depth of their penetration into the drifting flow ), in combusti-  
on chambers of gas turbine engines a high degree of turbulence  
(  $\epsilon_{\max} = 25-30\%$  ) can be obtained, thus ensuring an active mi-  
xing of fuel with air and a forced thorough combustion of the  
mixture. Six illustr., seven biblio. refs.

1/1

USSR

UDC 536.46.621.454

GORBUNOV, G., PESHKOV, A. V., KHRISTOFOROV, I. L., ENMIL', M. V.

"Air Flow Behind the Vane Swirler in the Fire Tube of the Combustion Chamber of a Gas Turbine Engine"

Kazan', Izvestiya Vysshikh Uchebnykh Zavedeniy -- Aviatsionnaya Tekhnika, No 1, 1971, pp 63-68

Abstract: A study is made of some of the characteristic features of the whirling flow in the forward section of the combustion chamber pertaining to the shape of the jet leaving the swirler, the static pressure distribution and the turbulence intensity. Comparison of the calculated and the experimental data shows that in the presence of proper agreement of the parameters of the vane swirler and the transition cone, a smooth continuous whirling flow is observed along the generatrix of the transition cone. The profile of the distribution of the turbulence intensity in the forward section of the chamber essentially depends on the aerodynamics of the flow which are determined by the shape of the frontal structure.

1/1

USSR

UDC: 621.791.4:539.378.3.01:669.295

VORONTSOV, YE. S., Doctor of Technical Sciences, PESHKOV, V. V., Candidate of Technical Sciences, and GRIGOR'YEVSKIY, V. I., Engineer, Voronezh Polytechnic Institute

"The Kinetics of Cleaning the Surface of Titanium of Oxide Films Under Conditions of a Vacuum"

Moscow, Svarochnoye Proizvodstvo, No 6, Jun 73, pp 5-7

Abstract: The authors develop a methodology for studying the kinetics of the dissolution of oxide films on titanium. The methodology is based on using interference tinting as a process indicator. Specimens of VT1 grade technically pure titanium and the OT4 titanium alloy (25X25X0.3) were ground to V6 class surface finish and washed in ethyl alcohol. Then they were oxidized in air at 600°C for 15 minutes until the appearance of an etalon, light-blue film, 5h2A thick. The role of closed cavities and autoevacuation is demonstrated in the mechanism of cleaning contacting titanium surfaces. A dependence is obtained of the dissolution time of an etalon light-blue tint, oxide film on temperature in the 525-625°C interval at an air pressure up to  $2 \cdot 10^{-2}$  mm Hg.

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172 010 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--REACTION OF MOLYBDENUM WITH OXIMES. REACTION OF MOLYBDENUM WITH  
MONO AND DIOXIMES OF ALPHA FURIL IN THE PRESENCE OF STANNOUS CHLORIDE  
AUTHOR--(02)-PESHKOVA, V.M., GURYEVA, YE.S.  
COUNTRY OF INFO--USSR  
SOURCE--VESTN. MOSK. UNIV., KHIM, 1970, 11,1, 79-83  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--OXIME, MOLYBDENUM COMPLEX, SPECTROPHOTOMETRIC ANALYSIS, TIN  
CHLORIDE, COMPLEX COMPOUND  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--1997/0586 STEP NO--UR/0189/70/011/001/0079/0083  
CIRC ACCESSION NO--AP0119504  
UNCLASSIFIED

2/2 010

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0119504

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE COMPLEX FORMATION OF MOLYBDENUM WITH MONO AND DIOXIMES OF ALPHA FURIL IN THE PRESENCE OF  $\text{SnCl}_4$  WAS INVESTIGATED SPECTROPHOTOMETRICALLY AT 390 AND 520 MM. THE RATIO OF COMPONENTS  $\text{Mo(V)}-\text{Sn(II)}-\text{MONOXIME}$  WAS 2 TO 6 TO 4. IN CASE OF DIOXIME THE RATIO COULD NOT BE ESTABLISHED ON ACCOUNT OF THE INSTABILITY OF THE COMPLEX.

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SECTION III

SO: Selected Research Materials

Physics

PC-29

SEP 71

Name: Institute of Biophysics, Pushchino

Description:

(U) During this quarterly reporting period, 25 new articles were

identified from the Institute of Biophysics, Pushchino. On the basis of these articles, it was possible to identify 37 new personalities with the Institute.

These personalities, the subjects of the articles, and the dates are given

below:

*Alt-biophysics/biophysics*

Allyova, S. A.	1971 (32)
Aplavaya, G. Z.	1970 (35)
Arifova, D. F.	1971 (36)
Ashipa, Ye. I.	1969 (37)
Bresadze, I. F.	1970 (38)
Bueel, Ye. P.	1970 (39)
Dalitskaya, T. I.	1970 (40)
Dmitriyeva, V. A.	1970 (41)
Donskova, O. P.	1971 (42)
Dubrov, A. P.	1971 (43)
Gabolova, N. A.	1971 (44)
Ganasel, Ye. E.	1970 (45)
Ivkova, M. N.	1972 (46)
Kasatkina, V. S.	1972 (47)
Klokhova, G. K.	1972 (48)
Kislov, A. N.	1970 (49)
Klyagina, V. P.	1970 (50)
Korol, B. A.	1971 (51)
Koshaleva, G. N.	1972 (52)

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Kuzmina, S. V.	tissue culture	1970 (47)
Martovitch, D. S.	lactate dehydrogenase	1971 (48)
Hedvedeva, I. E.	radiation effect	1971 (44)
Peshkova, L. V.	phosphorylation	1971 (49)
Pronevich, L. A.	antibiotic	1970 (50)
Podonova, H. A.	mitochondrion	1971 (51)
Sheklyukin, V. N.	phosphorylation	1971 (49)
Skobeyev, Ya. M.	radiation/vibration	1970 (52)
<del>Shchegolev, V. D.</del>	radiation effect	1970 (35)
<del>Tevekov, V. D.</del>	blood plasma	1969 (40)
Shurikina, N. V.	lactate dehydrogenase	1971 (48)
Vilenchik, N. M.	radiation effect	1970 (53)
Zemeynin, A. A.	muscle physiology	1971 (42)

Dubrov and Koshelova (41) are associated with the Laboratory of Cell Biophysics at the Institute. Reference 52 above is of special interest since it presents an investigation of combined stresses, i.e., radiation and vibration. In addition to the above articles, five of the twenty-five (54-58) were authored by persons already identified with the Institute of Biophysics, Puchchino. Reference 55 associates the authors of the article, L. V. Sizhenikhina, V. L. Misyagina, and A. M. Kuzin, with the Department of Radiobiology at the Institute.

UNCLASSIFIED



Biochemistry

UDC 576.31.4

USSR

EVTODIYENKO, YU. V., PESHKOVA, L. V., and SHCHIPAKIN, V. N., Institute of Biophysics, USSR Academy of Sciences, Pushchino-na-Oke

"Possible Mechanism of Calcium, Hydrogen, and Phosphate Ion Transport Through a Mitochondrial Membrane"

Ukrainskiy Biokhimicheskiy Zhurnal, Vol 43, No 1, 1971, pp 98-104

Abstract: Transport of  $\text{Ca}^{2+}$ ,  $\text{H}^+$ , and phosphate ( $\text{H}_3\text{PO}_4$ ,  $\text{H}_2\text{PO}_4^-$ ,  $\text{HPO}_4^{2-}$ , and  $\text{PO}_4^{3-}$ ) can occur across a mitochondrial membrane against the electrochemical potential with direct participation of mitochondrial ATP-ase. Literature and experimental data are presented to prove this point. Transport against the electrochemical potential at a mitochondrial membrane requires the involvement of at least two forms of ions with different properties. The transition from one form to the other must be coupled with an exothermic reaction, such as ATP hydrolysis. The carrier for mitochondrial  $\text{H}^+$  may be ATP-ase of the membrane.  $\text{Ca}^{2+}$  is similarly transported across a mitochondrial membrane. This calcium transfer is accompanied by phosphate transfer. A mechanism is proposed for the participation of ATP-ase in the transfer of the above types of ions, and this mechanism is explained in terms of literature data.

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PESKOV, B.G.

59208  
6-73

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IX-8b. EPITAXIAL DEPOSITION OF  $\beta$ -SIC LAYERS FROM THE GAS PHASE WITH RADIATION HEATING

Article by N. A. Spil'manov, in A. Vashov, N. G. Paskov, G. G. Petrov, A. D. Kozlov, Leningrad: Sovetskoye Radio, 111 Sbornik po Protekshim, Kuznetsov, 1977, p. 149.

The B-51C layers were deposited on the (0001) faces of the Al<sub>2</sub>O<sub>3</sub> crystals in a horizontal type reactor. The initial substrates were CH<sub>3</sub>SiCl<sub>3</sub> and H<sub>2</sub>. Radiation heating of the substrates was used which permitted them to be heated to the required temperatures without auxiliary elements. In order to realize the deposition process under its isothermal, a special device was built which provided for broad ventilation of the deposition conditions (the gas mixture component concentrations, substrate temperature, gas flow rate and pressure in the reactor), automatic regulation of the basic parameters and analysis of the gas mixture in the course of the process. Special attention has been given to insuring high purity of the initial substances and clean deposition conditions.

The growth of the monocrystalline layers of B-12C was observed only in a narrow range of values of the basic process parameters. The formation of the liquid layer and silicon droplets on a substrate disappearing during the course of the process and also on reduction of the flow rate through the reactor was observed. With constancy of the basic process parameters, the growth rate of the layer was not constantly usually it decreased with time, and in a number of cases the transition was noted from growth of this layer to etching of it. The greatest thickness of the epitaxial film was 70 microns. A study of the structure, the surface morphology and the uniformity of the layers.

PESKOV, B.G.

SPRS 57268  
6073

## SESSION IX

IX-82. THE MECHANISM AND KINETICS OF THE GAS-PHASE DEPOSITION OF B-SIC FROM  $\text{Cl}_2\text{SiCl}_3 + \text{H}_2$  WITH RADIATION HEATING

Article by Yu. A. Yezhov, B. G. Peskov, O. G. Peskov, A. D. Ryzynov, Leningrad; Novosibirsk, Ill slomozhilo po Podstavam. Re-2 s shkola Poluprovodnikovyykh Kristallov i Plenok, 1962Imy, 1241 June 1972, p 11

The growth of monocrySTALLINE layers of  $\beta$ -SIC on  $\alpha$ -SIC substrates from a gas mixture of  $\text{CH}_3\text{SiCl}_3$  +  $\text{H}_2$  in the presence of radiation heating is distinguished by a number of characteristic features weakly exhibited for other methods of heating the substrates. However, there are grounds for assuming that the mechanism of chemical reactions and the mechanism of crystallization in general features do not depend on the method of heating the substrate.

Direct experimental observations indicate the course of crystallization by the vapor-liquid-solid mechanism where the role of the liquid phase is played by the melt. The surface nature of the catalytic heating and, therefore, of the heating on the optical properties of the substance deposited on the side of the substrate turned toward the radiator cause growth anisotropy of the B-SiC layer.

The composition of the products of the deposition process of 5-5SC is well-described by the schematic of the chemical reactions constructed on the basis of a thermodynamic analysis. After the initial decay of the methyl trifluoromethane, two parallel branches of the chemical reactions take place — silicon and carbon. These branches are characterized by various kinetic parameters. The proposed schematic for the process explains the inversion of the dependence of the layer growth rate on the deposition parameter. From the investigation of the process mechanism and kinetics, the paths of optimizing the set of process conditions follow.

PESKOV, O.G.

SPES 590 08  
6-73

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12-Bb. EPITAXIAL DEPOSITION OF B-SiC LAYERS FROM THE GAS PHASE WITH RADIATION HEATING

Article by N. A. Brillenkov, Yu. A. Yeshov, B. G. Penkov, O. G. Peskov, A. D. Kovenkov, Leningrad; Novosibirsk, LIL, Sibirskiy nauchno-issledovatskiy tsentr i Sibirskiy nauchno-issledovatskiy tsentr, Novosibirsk, 19-11 June 1972, p 124

The B-SiC layers were deposited on the (0001) faces of the plate B-SiC crystals in a horizontal type reactor; the initial substances were  $CH_3SiCl_3$  and  $H_2$ . Radiation heating of the substrate was used which permitted them to be heated to the required temperatures without auxiliary elements. In order to realize the deposition process and its investigation, a special device was built which provides for broad variation of the deposition conditions: the gas mixture component concentration, substrate temperature, gas flow rate and pressure in the reactor, automatic regulation of the basic parameters and analysis of the gas mixture in the course of the process. Special attention has been given to insuring high purity of the initial substances and clean deposition conditions.

The growth of the monocrystalline layers of B-SiC was observed only in a narrow range of values of the basic process parameters. The formation of the liquid layer and silicon drops on a substrate disappearing during the course of the process and also on reduction of the flow rate through the reactor was observed. With constancy of the basic process parameters, the rate of the layer was not constant; usually it decreased with time, and in a number of cases the transition was noted from growth of the layer to etching of it. The greatest thickness of the epitaxial film was 70 microns. A study was made of the structure, the surface morphology and the uniformity of the layers.

PESKOV, O. G.

SPAS 59268

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SECTION IX

IX-8a. THE MECHANISM AND KINETICS OF THE GAS-PHASE DEPOSITION OF B-SiC FROM  $\text{CH}_3\text{SiCl}_3 + \text{H}_2$  WITH RADIATION HEATING

[Article by I. A. Yezhov, R. G. Peskov, U. G. Peskov, A. D. Ryzhenkov, Lenin-

grad, Novosibirsk, 117 Simbirskaya St., Novosibirsk, 630090, Russia; 1977 June 1977, p 133]

The growth of microcrystalline layers of B-SiC on Si-SiC substrates from a gas mixture of  $\text{CH}_3\text{SiCl}_3 + \text{H}_2$  in the presence of radiation heating is dis-

cussed. It is shown that the mechanism of chemical reactions and the mechanism of crystallization of the substrate do not depend on the method of heating the substrate.

Direct experimental observations indicate the course of crystallization played by the silicon. The surface nature of the role of the liquid phase is dependent on the heating on the optical properties of the substrate and the of the B-SiC layers.

The composition of the products of the deposition process of B-SiC is well-described by the schematic of the chemical reactions constructed on the basis of a thermodynamic analysis. After the initial decay of the methyl tri-chlorosilane, two parallel branches of the chemical reactions take place — one parallel to the temperature, the flow rate of the gas mixture and other parameters. The proposed schematic for the process exhibits the interrelation from the investigation of the layer growth rate on the deposition parameters, operating the set of process conditions follow.

USSR

UDC 543.01:546.76:546.681:546.19

DOLMANOVA, I., F., BOESHOVA, T. A., SHEKHOVTSOVA, T. N., and PESHKOVA, V. M.,  
Moscow State University imeni M. V. Lomonosov

"Kinetic Method for Determining Chromium Traces in Gallium Arsenide"  
Moscow, Zhurnal Analiticheskoy Khimii, Vol 27, Vyp 9, 1972, pp 1848-1851

Abstract: Column extraction and ion exchange chromatography are used to separate traces of Cr from the major elements GaAsO<sub>3</sub> and a Cu-Co-Ni mixture.

The sample is dissolved in nitric acid, oxidizing the arsenic to arsenic acid. The arsenic acid is carried through the column while the Cr(III) is adsorbed. The Cr (III) is subsequently removed from the column with 3 N HCl. Interfering ions of Cu (II), Co(II), and Ni(II)--were removed from the acid solution by extraction with dithizone in CCl<sub>4</sub> for 20-30 min on a mechanical shaker. Concentrations of Cr(III)--as the dithizonate in the aqueous phase--were determined from the oxidation by H<sub>2</sub>O<sub>2</sub> of o-dimethoxybenzidine if the concentrations were greater than 10<sup>-3</sup> micrograms/ml and of o-dimethoxybenzidine - γ-picoline for concentrations of 10<sup>-3</sup> to 10<sup>-5</sup>. The reaction was followed on a spectrophotometrically at λ<sub>max</sub> = 350 nm.

1/1

1/2 017  
UNCLASSIFIED  
TITLE--REACTION OF CERIUM (IV) WITH BETA DIKETONES -U- PROCESSING DATE--23OCT70  
AUTHOR--(03)-VORONETS, L.S., YEFIMOV, I.P., PESHKOVA, V.M.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. NEORG. KHIM. 1970, 15(3), 886-7  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--CHEMICAL SYNTHESIS, ORGANOMETALLIC COMPOUND, CERIUM COMPOUND,  
KETONE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1993/0734  
CIRC ACCESSION NO--AP0113598  
STEP NO--UR/0078/70/015/003/0886/0887  
UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0113598

ABSTRACT/EXTRACT--(U) GP-O-

DIKETONES IN AQ. SOLNS.

OF THE REDN. DEPENDS ON

DURATION OF THE REACTION.

LOMONOSOVA, MOSCOW, USSR.

ABSTRACT. REACTION OF CE(IV) WITH BETA  
IS ACCOMPANIED BY REDN. OF CE ION. THE DEGREE  
REDOX POTENTIAL OF BETA DIKETONES AND THE  
FACILITY: MUSK. GDS. UNIV. IM.

UNCLASSIFIED



Acc. Nr:

AP0034220

Abstracting Service:

CHEMICAL ABST. 4-70

Ref. Code:

2R 0078

71260s Complexing of titanium with N-benzoyl- and N-cinnamoylphenylhydroxylamines studied by an extraction method. Lobanov, F. I.; Savostina, V. M.; Fes'kova, V. M.; Shpigun, O. A.; Pechkova, V. M. (Mosk. Gos. Univ., Moscow, USSR). Zh. Neorg. Khim. 1970, 15(1), 161-4 (Russ.). Ti(IV) was extd. from 6N HClO<sub>4</sub> by C<sub>6</sub>H<sub>5</sub> soln. of N-benzoylphenylhydroxylamine (HA) or N-cinnamoylphenylhydroxylamine (HA'). Extn. consts. (*k*<sub>1</sub>) by HA and HA', given as log *k*<sub>1</sub>, are 9.81 ± 0.04 and 9.94 ± 0.04, resp. Stability consts. (*K*<sub>1</sub> to *K*<sub>4</sub> and β), detd. by the Bjerrum or by the L. Sillen-D. Dyrssen (1953) are tabulated. For HA-Ti(IV) complex, log β<sub>4</sub> is ~46.2 and for HA'-Ti(IV) complex ~52.0. HMIR

REEL/FRAME

19710873

USSR

UDC 616.988.25-092.4-07:616-003.931-074

MIRYUTOVA, T. L., and PESHKOVA, Ye. A., Tomsk Scientific Research Institute of  
Vaccines and Sera

"Activity of Some Glycolytic Enzymes in the Liquid Phase of Tissue Cultures  
Infected With Venezuelan Equine Encephalomyelitis Virus"

Moscow, Voprosy Virusologii, No 6, 1972, pp 717-720

Abstract: Activity of enzymes involved in carbohydrate metabolism was studied in chick and human embryo fibroblast cultures infected with VEE virus. Within 4 hours after infection of monolayers, glucose phosphate isomerase activity increased significantly, attained 125% of control by 48 hours at the peak of virus activity, and subsequently dropped. By 24 hours after infection lactate dehydrogenase activity twice exceeded that in controls. Aldolase activity remained normal until 48 hours, probably because the enzyme is incapable of penetrating intact cells, and increased after cell death. Thus it is demonstrated that the activity of enzymes responsible for providing energy to growing virus reflects the changes of virus reproduction rate.

1/1

USSR

UDC 616-009-097

PESHKUS, YU. K., LUKSHIS, L. P., and SADAUSKAS, P. B., Institute of Biochemistry, Academy of Sciences Lithuanian SSR

"Immune Characteristics of Cattle Lympholeukemia. 6. Agglutinin Formation and Blood Serum Protein Fractions After Immunization With Br. Abortus Bovis No 12 Vaccine"

Vil'nyus, Trudy Akademii Nauk Litovskoy SSR, Seriya B, Vol 2 (58), 1972, pp 89-98

Abstract: Cows with chronic lympholeukosis are able to produce antibodies, but the formation of agglutinins is somewhat depressed in them. Thus, after vaccination, the agglutinin titer is sick cows is 1:55 on the 5th day (1:90 in healthy cows), reaches a peak on the 20th day (15th day in healthy cows), and declines faster than in healthy cows. Serum protein concentration in sick cows is somewhat reduced, and the rise after vaccination, from 7.12% initial to 7.27%, is smaller than in healthy cows, from 7.76% initial to 8.20%. In sick cows, albumin level is 3.5% lower than, alpha and beta globulin levels are 2% higher than, and gamma globulin concentration is the same as in healthy cows. In sick cows, vaccination reduces albumin by 3-7%, raises alpha and beta globulins by 1-3%, but induces no significant change in gamma globulin. In 45-60 days, the various protein fractions return to their initial levels. In 1/2

- 91 -

USSR

PESHKUS, YU. K., et al., Trudy Akademii Nauk Litovskoy SSR, Seriya B, Vol 2 (58), 1972, pp 89-98

healthy cows, vaccination reduces albumin by 2-4%, does not change alpha and beta globulins, but increases gamma globulin by 1-3%. These effects are also over in 45-60 days. There is a good correlation between gamma globulin concentration and the agglutinin titer.

2/2

USSR

UDC 669.715'3'721:620.186:539.4

GALATSKIY, B. D., VAYNBLAT, Yu. M., PESHUKOV, K. G., KLEPACHEVSKAYA, S. Yu.,  
SAGALOVA, T. B., and FEDOROVA, K. A.

"Dependence of Texture and Mechanical Properties on Shape Factor and Degree  
of Deformation of Extruded Aluminum-Alloy Products"

Tekhnol. legkikh splavov. Nauchno-tekhn. byul. VILSa (Technology of Light  
Alloys. Scientific and Technical Bulletin of the All-Union Institute of  
Light Alloys), 1970, No 3, pp 28-35 (from RZh-Metallurgiya, No 12, Dec 70,  
Abstract No 12 1757 by E. KADANER)

Translation: An investigation was conducted on alloy D16 produced under in-  
dustrial conditions by the semicontinuous casting method with subsequent ex-  
trusion under various regimes. With an increase in the shape factor of ex-  
truded products, uniform variation of deformation texture from biaxial  $\langle 111 \rangle$ ,  
 $\langle 100 \rangle$  orientation to rolling texture takes place with predominant  $\{110\}$   $\langle 112 \rangle$   
orientation. With an increase in shape factor, strength anisotropy decreases.  
With the same degree of deformation and shape factor, ultimate strength and  
its anisotropy are independent of the size of the section of the product.  
Five illustrations. Three tables. Bibliography of seven titles.

1/1

AA0043410

UR 0482

Soviet Inventions Illustrated, Section II Electrical, Derwent,

2/70

242227 TRANSISTORISED BLOCKING GENERATOR, where to improve the frequency stability emitter of the transistor is connected through the diode (13) to the timing circuit RC (4) and (3). In parallel to the resistor (4) is connected stabilizer (5) and to the base of the transistor is connected second stabilizer (6) through the windings of the transformer (2). Supply is stabilized by stabilizer (8) and decoupled by capacitor (12). On application of positive voltage the capacitor (3) charges until it reaches resistive potential of the stabilizer (6). The transistor (1) opens and produces a pulse. Capacitor (3) discharges through resistor (7).

Stabilizer (5) neutralizes variation in gain of the transistor, magnetic variation of the core, and load variation. Stabilizer (6) neutralises influence of the collector reverse current and brings into balance voltage supply. Stabilizers (5) & (6) are chosen near the value  $l = 2.7l$ .

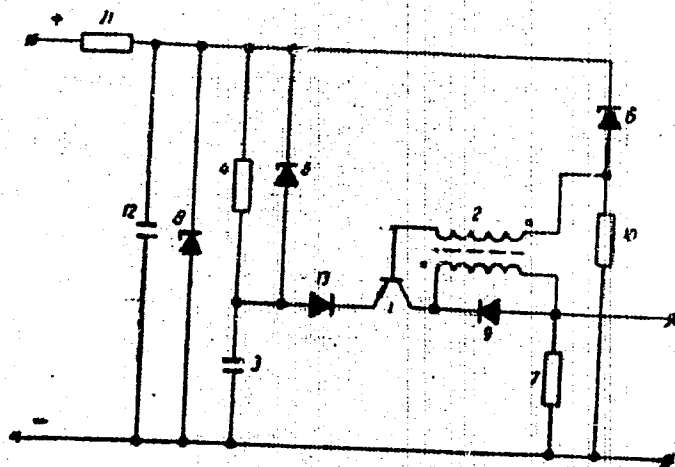
31.12.67 as 1122551/26-9. A.I. PESIN (16.9.69) Bul 15/25.4.69. Class 21a<sup>1</sup>. Int.Cl.H 03K.

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19761707

AA0043410



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19761708

gc

USSR

UDC 539.67

2

YEVSYUKOV, V. A., ZOLOTUKHIN, I. V., LEBEDINSKIY, V. S., PESIN, M. S.,  
POSTNIKOV, V. S., and SHARSHAKOV, I. M.

"Internal Friction in Phase Transformation in TiNi Intermetallic Compound"

Sb. "Vnutrenneye treniye v metallicheskih materialakh" (Internal Friction  
in Metallic Materials), Moscow, Izd-vo "Nauka," 1970, pp 163-165

Abstract: The nature of the phase transformation in an equiatomic TiNi compound is studied by methods of internal friction, electrical resistance, and dilatometric analysis. The presence of some peaks on the internal friction temperature dependence curve is reported and their features are discussed. The energies of the activation processes are determined. It is assumed that the internal friction peak at 16°C is governed by the diffusion-free phase transformation. Data on internal friction, electrical resistance, and linear characteristics coincide well and confirm the assumed nature of the processes. 3 figures, 6 references.

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USSR

UDC 539.67

ARTYEMENKO, A. G., LEVIN, Yu. N., MASLENNIKOV, E. M., PESIN, M. S., and POSTNIKOV, V. S.

"Mechanism of Energy Absorption in Diffusion Shape Variation of Impurities in Binary Alloys"

Sb. "Vnutrenneye treniye v metallicheskih materialakh" (Internal Friction in Metallic Materials), Moscow, Izd-vo "Nauka," 1970, pp 159-163

Abstract: A short description and an experimental verification by the internal friction method of the energy absorption mechanism in diffusion shape variation of impurities in binary alloys are presented.

Alloys of Cd-Ge, Zn-Ge, and Bi-Ag eutectic composition systems were used as impurity-containing alloys. Peaks related to diffusion, occurring along the impurities boundaries as a result of the onset of an inhomogeneous stress state during measurements, were obtained on internal friction amplitude-dependence curves.

The results obtained confirm the theory of the impurities diffusion shape variation mechanism developed earlier. 2 figures, 6 references.

1/1

- 82 -

1/2 029 UNCLASSIFIED PROCESSING DATE--20NOV70/  
TITLE--PHASE TRANSFORMATIONS IN THE INTERMETALLIC COMPOUND TINI -U-  
AUTHOR--(05)-PLSTNIKOV, V.S., LEBEDINSKIY, V.S., YEVSUYKOV, V.A.,  
SHARS-~~AKLV~~, I.M., PESIN, M.S. P  
COUNTRY OF INFO--USSR  
SOURCE--FIZIKA METALLOV I METALLOVEDENIE, VOL. 29, FEB. 1970, P. 364-369  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS, CHEMISTRY  
TOPIC TAGS--ALLOY PHASE TRANSFORMATION, BIBLIOGRAPHY, METAL INTERNAL  
FRICTION, TITANIUM ALLOY, NICKEL, INTERMETALLIC COMPOUND, DILATOMETRIC  
ANALYSIS, RESISTIVITY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1995/0895 STEP NO--UR/0126/70/029/000/0364/0369  
CIRC ACCESSION NO--AP0116405  
UNCLASSIFIED

2/2 029

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0116405

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. STUDY OF PHASE TRANSFORMATIONS IN THE ALLOY TINI WITH EQUIATOMIC COMPOSITION, USING METHODS OF INTERNAL FRICTION, ELECTRICAL RESISTIVITY, AND DILATOMETRY. IT IS SUGGESTED THAT THE TRANSFORMATION AT TEMPERATURES RANGING FROM 50 TO PLUS 80 C IS OF A DIFFUSIONLESS TYPE AND IS CHARACTERIZED BY SMALL TEMPERATURE HYSTERESIS. A PHASE TRANSFORMATION OF AN ORDER DISORDER TYPE WAS DETECTED AT A TEMPERATURE OF 625 C. FACILITY: VORONEZHSKII POLITEKHNICHESKII INSTITUT, VORONEZH, USSR.

UNCLASSIFIED

USSR

UDC 669.24:538.221

BORODKINA, M. M., PESIN, V. S., SMIRNOVA, L. G., SOSNIN, V. V., and STAROSTIN, Yu. V., Institute of Precision Alloys of the Central Institute of Ferrous Metallurgy imeni I. P. Bardin

"Magnetic Properties and Texture of a Thin Band of Nickel-Iron-Molybdenum Alloys"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 33, No 6, Jun 72, pp 1188-1194

Abstract: A study was made of the magnetic properties (coercive force, induction, and the rectangularity factor) and the texture of bands of Ni-Fe-Mo alloys (75-87%Ni, 0-5.5%Mo) 20, 5, and 2  $\mu$ m thick. The optimum cooling rate ensuring the highest  $\alpha$  value depends on Ni and Mo contents and the final reduction value in rolling. The optimum final reduction increases with decreasing thickness. The predominance of the  $\langle 111 \rangle$  or  $\langle 100 \rangle$  textures is essentially for  $\alpha$  in the case of relatively thick bands ( $\geq 5 \mu$ m). For 20- $\mu$ m-thick bands, there is a correlation between the relation of the  $\langle 111 \rangle$  &  $\langle 100 \rangle$  orientations and the rectangularity factor  $\alpha$ . For 5- $\mu$ m-thick bands, a correlation is observed only at high reductions, and for 2- $\mu$ m-thick bands there is no correlation. In the thinnest bands, a mechanism which is independent of the magnetocrystalline anisotropy and which can be related to orientated imperfections produced by rolling with high reduction rates, is probably predominant. Six figures, two tables, twelve bibliographic references.

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USSR

UDC: 51

MELESHKO, V. I., PESINA, R. I.

"Optimum Synthesis of Complex Systems by Methods of Adaptive Optimization in the Presence of Limitations of Strict Classification"

Pribory i sistemy avtomatiki. Resp. mezhved. temat. nauch.-tekhn. sb. (Devices and Systems of Automation. Republic Interdepartmental Thematic Scientific and Technical Collection), 1973, vyp. 26, pp 15-25 (from RZh-Kibernetika, No 7, Jul 73, abstract No 7V509 by the authors)

Translation: Methods are considered for solving optimization problems for a conditional extremum in the presence of limitations, including limitations of strict classification. The extremum is sought by a modified method of conjugate gradients. This method has a quadratic rate of convergence. For reduction to an unconditional extremum use is made of a combination of the methods of penalty functions and minimization in the space of least dimensionality with exit to the boundary of the region of search. It is proved that the proposed method converges to a local extremum for functionals bounded from below when their derivative satisfies the Lipschitz condition. A model is presented for inventory control

1/2

USSR

MELESHKO, V. I., PESINA, R. I., Pribory i sistemy avtomatiki. Resp.  
mezhved. temat. nauch.-tekhn. sb., 1973, vyp. 26, pp 15-25  
with grouped deliveries and a limited deficit.

2/2

- 34 -

1/2 008 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--TWO PYRIDYLAZONAPHTHOL ISOMERS AND THEIR REACTION WITH COPPER IONS.  
-U-  
AUTHOR--GUSEV, S.I., GLUSHKOVA, I.N., KETOVA, L.A., PESIS, A.S.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. ANAL. KHIM. 1970, 25(2), 260-6  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--PYRIDINE, AZO COMPOUND, NAPHTHOL, COPPER COMPLEX, EQUILIBRIUM  
CONSTANT  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1987/1687 STEP NO--UR/0075/70/025/002/0260/0266  
CIRC ACCESSION NO--AP0104902

UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--11 SEP 70

CIRC ACCESSION NO--AP0104902

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A MIXT. OF

2, (2, PYRIDYLAZO), 1, NAPHTHOL (I) AND 4, (2, PYRIDYLAZO), 1, NAPHTHOL (II) WAS OBTAINED. NA 2, PYRIDYLAZOTATE (17 G) IN 75 ML ETOH WITH 17.3 G NAPHTHOL WAS TREATED WITH CO SUB2 UNTIL A THICK PASTE IS FORMED TO GIVE I AND II BY FRACTIONAL CRYSTN. I HAS LAMBDA 360, 470 MMU; II HAS LAMBDA 450 MMU.

PK SUBNH AND PK SUBOH OF I AND II WERE 1.05 PLUS OR MINUS 0.13 AND 11.11 PLUS OR MINUS 0.16 AND 1.57 PLUS OR MINUS 0.16 AND 10.45 PLUS OR MINUS 0.49, RESP. I FORMS WITH CU 1:1 AND 1:2 COMPLEXES, DEPENDING ON THE PH AND THE REAGENT RATIO. WITH EXCESS REAGENT THE COMPLEXES HAVE LAMBDA 570 MMU AT PH 1-3 AND LAMBDA 560 MMU AT PH 5-6. WITH CU IONS EXCESS LAMBDA IS 570 MMU. THE 1:1 COMPLEX CAN BE EXT'D. WITH BUOH, THE 1:2 COMPLEX WITH CCL SUB4. MOLAR ABSORPTIVITY OF THE COMPLEXES, THEIR INSTABILITY CONSTS., AND REACTION EQUIL. CONSTS. FOR THE CU-I (PH 1-3) COMPLEX, THE CU-I (PH 5-6) AND THE CU-II COMPLEX WERE AS FOLLOWS:

(2.447 TIMES 10 PRIME4, (2.87 PLUS OR MINUS 0.46) TIMES 10 PRIME NEGATIVE6, (1.18 PLUS OR MINUS 0.02) TIMES 10 PRIME NEGATIVE4; 4.745 TIMES 10 PRIME4, (7.61 PLUS OR MINUS 0.99) TIMES 10 PRIME NEGATIVE7, (6.45 PLUS OR MINUS 0.29) TIMES 10 PRIME NEGATIVE4; 3.95 TIMES 10 PRIME4, (2.70 PLUS OR MINUS 0.02) TIMES 10 PRIME NEGATIVE5, (6.79 PLUS OR MINUS 0.07) TIMES 10 PRIME NEGATIVE4.



PESKOV, B. Ye.

hydrometeorology

DATE AND PROSPECTS OF OPERATIVE FORECASTING OF ESPECIALLY DANGEROUS  
HYDROMETEOROLOGICAL PHENOMENA

UDC 551.379.32

Article by Academician of the USSR Academy of Sciences B. Ye. PESKOV, Candidate of Geophysics Sciences B. Ye. PESKOV, USSR Hydrometeorological Station  
Lithic Research Center, Moscow, Hydrometeorological Station, Moscow No. 1,  
1972, submitted 7 March 1972, pp 100-113

A study was made of the state of the operational developments  
main respect to forecasting a broad line of especially dangerous  
our hydrometeorological phenomena and the measures for work  
in this area.

Forecasting, state and operational hydrometeorological phenomena  
of, as is now said, dangerous and especially dangerous phenomena  
most important stations of our weather service. The weather service began 100  
years ago as a storm warning service for the maritime fleet. Daily forecasting  
for the national economy and the entire population of the country began only  
gradually.

However, forecasting dangerous and especially dangerous phenomena  
only has not lost its significance, but it has acquired still greater importance.  
This is understandable since the technological progress of any production facility (our branch of the national economy) has been adapted to ordinary  
weather conditions. No harm comes from poor weather conditions; on the contrary,  
it is possible to extract great additional use. Our national economy,  
as it appears to us, still makes poor use of this possibility. In connection  
with the fact that the level of economic development will increase, we must develop  
new methods of hydrometeorological supply under favorable weather conditions.  
Some examples of this are known to us. There are weather forecasts for the  
heat and electric power stations which generate heat in accordance with the  
forecast and obtain significant savings in fuel consumption. There are recommendations  
for sailing ships when by selecting favorable conditions for  
the trip, they can save, work easily with low stability is transported easily,  
the aircraft flying. The aircraft of which in the overwhelming majority of  
cases make trips under favorable conditions which offers the possibility of  
calculating their load advantageously. Probably it is possible to find other

- 133 -

Source: #5651  
1985 #5651  
Hydrometeorology  
2

USSR

UDC 621.396.6.049.75.002

PESKOV, M. I., PIGARIN, Ye. G., MAR'IN, Yu. A.

"High-Speed Automatic Equipment for Making Photographic Positives of Multilayered Circuit Boards"

V sb. Obmen opytom v radioprom-sti (Experience Pooling in the Radio Industry--collection of works), vyp 7, Moscow, 1971, pp 31-34 (from RZh-Radiotekhnika, No 11, Nov 71, Abstract No 11V383)

Translation: The paper describes the control circuitry of equipment for automatic reproduction of photopositives of printed circuit boards from information recorded on punched cards. A buffer memory is added to the control device, which increases the productivity of the equipment by reproducing information on a complete line of the drawing on the photographic positive in the line-by-line method of reproduction. The quantity of information on the punched tapes was reduced by using the principle of separate drawing of horizontal and vertical lines. Ye. M.

1/1

USSR

UDC 621.396.6.048.75.002

PESKOV, M. I., FIGARIN, Ye. G.

"Methods for Semiautomatic Preparation of Photopositives of Printed Circuit Boards From a Drawing"

V sb. Obmen opytom v radioprom-sti (Experience Pooling in the Radio Industry--collection of works), vyp. 7, Moscow, 1971, pp 34-38 (from RZh-Radiotekhnika, No 11, Nov 71, Abstract No 11V385)

Translation: Two methods are described for semiautomatic production of photopositives of printed circuit boards without drawing exact photo originals. In the first method the designer transfers the drawing on a special device (copier) to a photographic plate in a certain scale, and in the second, the designer's drawing, made on standard graph paper, is coded either manually or on a special coding-decoding device to give a set of punched cards. The methods eliminate the step of making precision photo originals, cut down the labor expended on this step by a factor of 7-10, and guarantee stable accuracy in making photopositives. Bibliography of two titles. Ye. M.

1/1

79

USSR

UDC 621.375.7

YERU, I. I. PESKOVATSKIY, S. A., Institute of Radio Physics and Electronics  
of the Ukrainian SSR Academy of Sciences

"Utilization of Andalusite in 'Warm' Paramagnetic Amplifiers"

Gor'kiy, Izvestiya vysshikh uchevnykh zavedeniy, Radiofizika, Vol XV, No 1,  
1972, pp 38-42

**Abstract:** An experimental study was made of the population inversion of the spin levels of  $\text{Fe}^{3+}$  ions in andalusite ( $\text{Al}_2\text{SiO}_5$ ) in the three-centimeter range and the temperature range of 2-60° K. In this temperature range in andalusite, in contrast to ruby and rutile, there is still no noticeable effect from the two-phonon relaxation processes. The possibilities of using andalusite in masers operating at increased temperatures are analyzed.

Experimental curves are presented showing that the inversion coefficient in andalusite even at the temperature of liquid nitrogen in the three-centimeter range does not drop below 2.0-2.2 which is at least twice as high as in ruby at the same temperatures. This means that in an andalusite maser in the three-centimeter range it is possible to count on obtaining a noise temperature of 40-50° K at the temperature of liquid nitrogen (77.4° K). If the operating frequency of the amplifier is reduced and we go to the 10 centimeter range,  
1/2

USSR

YERU, I. I., et al., Izvestiya vysshikh uchevnykh zavedeniy, Radiofizika, Vol XV, No 1, 1972, pp 38-42

at the temperature of liquid nitrogen an inversion coefficient of 6-7 can be obtained and the noise temperature can be reduced to 20-25° K. With a favorable ratio of the Hamiltonian constants  $A_1$  and  $A_2$  ( $A_1/A_2 \gg 1$ , that is, in the absence of the effect of the upper, third doublet) it is theoretically possible to obtain an even higher inversion coefficient at the nitrogen temperature than at the helium temperature.

2/2

Acc. Nr: AP0043682

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy  
Fiziki, 1970, Vol 58, Nr 3, pp 897-902

A THIN SUPERCONDUCTING FILM IN AN UHF FIELD

Peskovatskiy, S. A.

Dynamic destruction of superconductivity of a thin film by an UHF current is considered within the framework of the phenomenological theory. Excitation of Cooper pairs through an energy gap by an UHF current of frequency  $\omega \ll kT$  is discussed. The possibilities of studying the gap and the relaxation rate in the condensed state which arise in this case are mentioned.

REEL/FRAME  
19770086

21

Acc. Nr: **AP0043767**

Ref. Code: UR 0056

PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy  
Fiziki, 1970, Vol 58, Nr 3, pp 778-785

**THIN SUPERCONDUCTING FILMS IN A UHF FIELD.**

**II. NONLINEAR PROPERTIES OF THIN SUPERCONDUCTING FILMS  
IN A UHF FIELD**

Yeru, I. I.; Kashchey, V. A.; Peskovatskiy, S. A.

The nonlinear properties of thin ( $d < \lambda_L(0)$ ,  $d < \xi_0$ ) lead, tin and indium superconducting films in a UHF field ( $10^{10}$  Hz) are investigated experimentally at temperatures between 1.5 and 4.2° K. The results which can be explained by excitation of Cooper pairs via the energy gap by an UHF current, agree well with the pair excitation mechanism considered in the first part of the paper [1], despite the fact that the results were obtained with films possessing a nonuniform current distribution along the film length. The results also indicate a new possibility of observing the behavior of the principal superconductor parameters and measuring their relaxation rate.

REEL/FRAME  
**19770174**

21 *hkh*

USSR

UDC: 621.311.69

SINITSYN, N. I., SHEVCHIK, V. N., PESOCHINSKIY, Z. I., Scientific Research  
Institute of Mechanics and Physics Affiliated With Saratov State University

"A Supply Device for a Backward-Wave Traveling-Wave Tube"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki,  
No 7, Mar 72, Author's Certificate No 329648, Division H, filed 13 Oct 70,  
published 9 Feb 72, p 220

Translation: This Author's Certificate introduces a supply device for a  
backward-wave traveling-wave tube with a decelerating system in the form of  
electrodes with openings of alternating transverse dimensions for passage  
of electrons and with periodic electrostatic focusing. The device contains  
several voltage sources. As a distinguishing feature of the patent, the  
current drain on the frequency control circuit is eliminated by connecting  
the source of voltage for electric frequency control by its positive lead to  
the cathode of the tube, and by its negative lead to the electrodes with  
larger electron-passage openings, while the source of voltage applied to  
the electrodes with smaller electron-passage openings is connected to the  
cathode by its negative lead.

1/1

- 90 -



PESOTSKIY, G.S.

SPRS  
L9068  
6-73

5

XIII-9. STUDY OF THE PROPERTIES AND CONDITIONS OF GROWTH OF EPITAXIAL LAYERS OF GALLIUM ARSENIDE FROM SOLUTION IN A GALLIUM MELT

[Article by J. Ye. Karchuk, G. S. Pesotskiy, Yu. G. Pukhov, B. I. Sushko, A. N. Tsvetkov, Svetlana Novikova, III Simpozium po Protekaniyu Rosta i Stroeniyu Poluprovodnikov Nizkolegionov i Pionov, Russian, 12-17 June 1972, p 191]

The epitaxial layers of gallium arsenide were grown from a solution in a gallium melt in a vertical reactor. The gallium melt placed in a container of carbon glass was saturated by arsenic by decomposition of AsCl<sub>3</sub>. A study was made of the effect of the growth temperature, the cooling rate, the melt volume and the orientation plane of the substrate on the morphology, the growth rate and the structural characteristics of the epitaxial layers. The sources of uncontrolled structure were analyzed for growth of the gallium arsenide layers.

USSR

UDC 536.421.4+536.421.1

KUZNETSOV, V. I., MOHRITSKIY, V. A. BUKAYEV, V. A., and PESOTSKIY, G. S.

"Investigating Epitaxy Conditions of Gallium Arsenide"

V sb. Kristallizatsiya i faz. prevrashcheniya (Crystallization and Phase Transformations--collection of works) Minsk, "Nauka i tekhn." 1971, pp 71-79 (from RZh-Fizika, No. 9, 1971, Abstract No. 9E397)

Translation: The peculiarities of the oriented growth of GaAs layers from a solution of As in a Ga melt on a GaAs substrate are investigated. A method is developed for obtaining early stages of the epitaxial layers from the solution-melt. An optimal method is selected for processing the substrate surfaces as well as for conditions of epitaxy of the layers with sufficiently perfect crystalline structures and good electrophysical characteristics.

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USSR

UDC 536.7

SHAULOV, YU. KH., SHINKAREV, A. N., and PESOTSKIY, G. S., Moscow Institute of Electronic Machine-Building

"The Thermodynamics of Synthesizing Semiconducting Compounds from Organo-Elemental Compounds. I. The Thermodynamics of Triethylgallium Synthesis and Pyrolysis"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 46, Vyp 8, 1972, p 2168

Translation: Reactions occurring in the gas phase are widely employed to obtain films of semiconducting compounds of the  $AIIBV$  type -- gallium nitride, phosphide, and arsenide in particular.

The low vapor pressure of gallium over its melt makes its transfer to the crystal-growth zone, using simple transport by an inert gas or hydrogen, practically impossible. Organo-elemental gallium compounds, for example triethylgallium, which has a relatively high volatility, are employed for this purpose. This practice requires a thorough investigation of the physicochemical and procedural parameters of the process.

This paper provides a thermodynamic analysis of triethylgallium synthesis and pyrolysis occurring in the reaction between gallium and ethyl chloride. 1/1

1/2 009

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--USE OF ELECTROLYTIC SODIUM BISULFATE FOR PRESERVING GREEN PLANTS  
-U-

AUTHOR--(03)--BEYDIN, V.K., PESOTSKIY, V.F., RADINA, G.N.

COUNTRY OF INFO--USSR

SOURCE--KHIM. SEL. KHOZ. 1970, 8(2), 139-40

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, CHEMISTRY

TOPIC TAGS--SODIUM COMPOUND, SULFATE, HYDROGEN COMPOUND, PLANT SPRAYING

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--2000/1370

STEP NO--UR/0394/70/008/002/0139/0140

CIRC ACCESSION NO--AP0125018

UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0125018

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ELECTROLYTICALLY PRODUCED NAHSO  
SUB4 IN THE FORM OF PELLETS OR FLAKES AND WATER SOL. (50PERCENT),  
CONTAINS 82-99PERCENT NAHSO SUB4 AND HAS A D. OF 2.47. THE PRESERVATIVE  
PROPERTIES FOR GREEN PLANTS ARE SIMILAR TO THOSE OF OTHER PRESERVATIVES.

UNCLASSIFIED

USSR

PESOV, A. I.

"Design of Avalanche Baffle Works to Withstand Impact"

Sb. nauchn. tr. VNII transp. str-va (Collection of Scientific Works of All-Union Scientific Research Institute of Transport Construction), 1970, vyp 35, pp 83-91 (from RZhOMekhanika, No 1, Jan 71, Abstract No 1V831 by V. M. Shamin)

Translation: The author considers certain details of the procedure used to design avalanche baffle works in order to withstand the impact of falling detritus. It is noted that during the testing of one of these walls it was found that the depth to which rocks penetrated the cushioning layer proved to be one and a half to two times less than calculated. In calculating walls to withstand the impact of detritus the author recommends distributing this load over the entire length of the wall section, as a result of which a significant decrease in the volume of earthwork is achieved. It is noted that the coefficient of restitution on impact of detritus against the bottom of the spandrel, which is used in the calculations, depends on the size and shape of the detritus, as well as its angle of fall. Therefore, in order to decrease the volume of earthwork it is recommended that the magnitude of this coefficient be established experimentally.

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USSR

UDC: 8.74

BUGAYEV, V. N., SAVINKOV, V. M., PESTEREV, V. F.

"Using a Digital Computer to Set up a Class Schedule in an Institution of Higher Education"

V sb. Primeneniye mat. metodov i vychisl. tekhn. v upr. vyssh. uchebn. zavedeniyami. Vyp. 2 (Use of Mathematical Methods and Computer Technology in Administration of Institutions of Higher Education--collection of works), vyp. 2, Moscow, 1971, pp 126-138 (from RZh-Kibernetika, No 4, Apr 72, Abstract No 4V564)

Translation: The compilation of a class schedule is treated as a problem in distribution of resources on a network model of the academic process when constraints imposed on the resources are given. The network model of the academic process is represented by a network graph which maps the course of the academic process in a plane. A vertex on the network graph denotes an educational institution (lecture, exercise, seminar, practical class, supervisory work, laboratory work, course planning, independent work, examination) provided by the plan for passing through the  $l$ -th discipline. The arcs going away from the  $l$ -th discipline or approaching it determine the connections between the given discipline and other disciplines of the academic plan. The initial data for construction of the

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USSR

UDC 621.378.335

KRUGLIK, G.S., PESTOV, E.G.

"General Method Of Calculation Of A Beat Frequency In A Single-Mode Ring Laser"

Kvantovaya elektronika (Quantum Electronics), Moscow, No 5(11), 1972, pp 22-29

**Abstract:** On the basis of a general analysis of input equations -- the well known system of shortened amplitude-phase equations developed for coupled modes of a ring laser in an approximation of a weak field -- a more precise formula is introduced for the beat frequency of a ring laser operating in a single-mode stationary regime. In addition, one of the possible solutions is offered of the reverse problem: determination of the rotational speed of a system with respect to the changed values of the beat frequency and the intensity of opposite-directed waves. The authors thank P.A. Apanasovich for critical remarks. 1 fig. 11 ref. Received by editors, 28 Sept 1971.

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USSR

UDC: 621.378.3

PESTOV, E. G. and KRUGLIK, G. S.

"Polarization Effect of the Competitive Weakening of Opposing Waves in Ring Lasers"

Minsk, Zhurnal prikladnoy spektroskopii, vol 16, No 6, 1972, pp 985-990

Abstract: Opposing waves in ring lasers leads to the suppression of one of the waves and sharply varies the beat frequency as a function of the resonator perimeter adjustment. In the present paper, a method other than the conventional one for reducing the competition of the opposing waves is presented. It is based on a reduction in the effect of cross-saturation for opposing waves with different polarizations. The advantage of this polarization method is that it reduces the linear coupling between the waves because of the inverse dispersion in addition to weakening the nonlinear interaction of the waves. The theory of the method is developed, beginning with the expressions for the constant components of the intensities of the opposing waves. The authors express their gratitude to S. G. Rautian and P. A. Apanasevich for their useful discussions of the paper.

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1/2 050 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--PARAMETRIC RESONANCE IN AN ANNULAR LASER -U-  
AUTHOR--(04)-KRUGLIK, G.S., PESTOV, E.G., POKROVSKIY, V.P., KUTSAK, A.A.  
COUNTRY OF INFO--USSR  
SOURCE--VSESOIUZNYI SIMPOZIUM PO FIZIKE GAZOVYKH OKG, NOVOSIBIRSK, USSR,  
JUNE 1969. ZHURNAL PRIKLADNOI SPEKTROSKOPII, VOL 12, MAR 1970, P.  
DATE PUBLISHED----MAR 70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--GAS LASER, PERTURBATION, LASER STABILITY, PARAMETRIC  
RESONANCE, FREQUENCY CHARACTERISTIC  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1989/2025 STEP NO--UR/0368/70/012/000/0432/0440  
CIRC ACCESSION NO--AT0108351  
UNCLASSIFIED

2/2 050

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AT0108351

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE EFFECT OF AN EXTERNAL PERIODIC PERTURBATION ON THE DIFFERENCE FREQUENCY OF OPPOSITELY MOVING WAVES IN AN ANNULAR GAS LASER. IT IS SHOWN THAT IN THE RESONANCE RANGE, WHERE THE PERTURBATION FREQUENCY IS CLOSE TO THE BEAT FREQUENCY, THE ORDINARY CONDITIONS OF OPERATION OF AN ANNULAR LASER BECOME UNSTABLE. A QUALITATIVELY NEW REGIME OF FORCED SYNCHRONIZATION WITH THE FREQUENCY OF THE ACTING PERTURBATION ARISES, LEADING TO A COMPLETE LOSS OF INFORMATION ABOUT THE ROTATIONAL VELOCITY OF THE SYSTEM. THE CALCULATED WIDTH OF THE SYNCHRONIZATION ZONE IS IN QUALITATIVE AGREEMENT WITH EXPERIMENTAL DATA.

UNCLASSIFIED

PESTOV, I.D.

JPRS 55714

14 April 1972

MEASURES AGAINST THE UNFAVORABLE EFFECT OF WEIGHTLESSNESS

[Article by A. Gents and I. Pestov, Moscow, Aviatsiya i Kosmonavtika, Russian, No 3, 1972, signed to press 1 February 1972, pp 30-33]

Introduction

Among the problems discussed at the Fourth International Symposium "Man in Space" an important place was occupied by the problem of preventing the unfavorable effect of prolonged weightlessness on the human body. Soviet scientists, A. Z. Gents and I. D. Pestov, specialists in the space medicine field, presented a report on the studies being made in this direction. The following report is presented for the perusal of our readers.

Planned space flights have yielded sufficient material for an objective evaluation of the restrictions imposed by weightlessness on the duration of presence of cosmonauts aboard space vehicles.

The unfavorable aftereffects of weightlessness were clearly manifested already during the 10-day flight of A. G. Nikitayev and Y. I. Sevast'yanov aboard the "Vostok-2" ship. Return to terrestrial conditions was accompanied in the cosmonauts by a sensation of increased body weight, a decrease in physical performance, a deterioration in tolerance of vertical posture, changes in gait, and a number of other impairments. Accordingly, the problem arose of the need for developing means for preventing these unfavorable phenomena.

The unfavorable reactions observed in cosmonauts during return to terrestrial gravitation are reproduced to a considerable degree by the laboratory simulation of weightlessness. For example, they are observed after prolonged immersion of

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[I - USSR - A/C]

1/2 035  
TITLE--THE WEIGHTLESSNESS BARRIER -U- UNCLASSIFIED  
AUTHOR--PESTOV, I. D. P  
COUNTRY OF INFO--USSR  
SOURCE--KRASNAYA ZVEZDA, JUNE 18, 1970, P 4, COLS 4-7  
DATE PUBLISHED--18JUN70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--BIOLOGIC WEIGHTLESSNESS EFFECT, SPACE MEDICINE, ASTRONAUTICS,  
MEDICAL EXPERIMENT, CENTRIFUGE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1990/1118  
CIRC ACCESSION NO--AN0109237  
STEP NO--UR/9008/70/000/000/0004/0004  
UNCLASSIFIED

2/2 035

UNCLASSIFIED

PROCESSING DATE--09OCT70

CIRC ACCESSION NO--AN0109237

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. IN DISCUSSING THE EFFECT OF WEIGHTLESSNESS UPON HUMAN ORGANISM, THE AUTHOR MENTIONS SEVERAL POSSIBLE MEANS OF COUNTERACTING IT. ONE METHOD EMPLOYS SPECIAL PHYSICAL TRAINING OF ASTRONAUTS. ANOTHER METHOD CONSISTS IN APPLYING A NEGATIVE PRESSURE UPON LOWER EXTREMITIES OF THE ASTRONAUT. THE AUTHOR ALSO MENTIONS PHARMACOLOGICAL AND HORMONE PREPARATIONS. ESPECIAL ATTENTION IS GIVEN TO THE METHOD OF CREATING AN ARTIFICIAL GRAVITY THAT WAS PROPOSED BY TSIOLKOVSKIY. EXPERIMENTS IN THIS DIRECTION WERE CONDUCTED WITH ANIMALS FLOWN IN A "LABORATORY" AIRPLANE EQUIPPED WITH A SMALL CENTRIFUGE.

UNCLASSIFIED

PESTOV, Ye. N.

UDC 550.838.002.56  
A QUANTUM FLUXMETER FOR MEASURING WEAK AND VERY WEAK MAGNETIC  
FIELDS WITH A SUPERCONDUCTING QUANTUM INTERFERENCE SENSOR  
[Article by Ye. N. Pestov and B. V. Skrotskiy; Leningrad,  
Geofizicheskaya Axbatatura, Russian, No 45, 1971, pp 24-28]

Either the phenomenon of quantizing magnetic flux in  
an SC circuit [Pestov, Skrotskiy, 1970] or a phenomenon sen-  
sitive to it, of the coherent electron fluxes interference  
[Bmitrenko, 1968; Zimmerman, Silver, 1966] may be considered  
the basis of the operation of magnetometers with superconduct-  
ing sensors (SC).

It is well known that a magnetic flux passing through  
an SC circuit is quantized; that is to say, it is an N-time  
integer of the flux quantum  $\Phi_0 = 2.07 \times 10^{-7}$  maxwells. If  
the external field flux  $\Phi$  coupled with the SC circuit is dif-  
ferent from  $N\Phi_0$ , a surface current  $I_s$  appears in the circuit,  
generating a flux  $I_s L$  that strictly balances this difference:

$$LI + \Phi = N\Phi_0, \quad (1)$$

where  $L$  is the surface inductance of the SC circuit with  
area  $F$ .

Upon varying the external field  $H = \Phi/F$ , which we are  
going to consider as uniform within the circuit limits, cur-  
rent  $I_s$  oscillates, varying from zero to  $I_{\max} = \Phi_0/2L$ .

The diameter of the wire of which the circuit is made  
(a turn) is so selected as to have current  $I_s$  producing on  
its surface a magnetic field considerably smaller than the  
critical at which the SC begins to disintegrate.

If a contraction is produced in the circuit loop by  
decreasing the wire diameter sharply at any point of the turn  
(for example, in sections 1, 2 of fig. 1, a) the SC may dis-  
integrate at these points even at  $I_s$  currents, compensating

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JPRS 56099  
25 May 72

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6679 (SLAC-Trans-105) PRELIMINARY RESULTS OF A STUDY OF THE  $\rho$ -MESON RESONANCE USING COLLIDING ELECTRON-POSITRON BEAMS. Balakin, V. E.; Budker, G. I.; Korshunov, Yu. V.; Mishnev, S. I.; Pakhtusova, E. V.; Pestrov, Yu. N.; Sidorov, V. A.; Skrinshil, A. N.; Tumaikin, G. I.; Khlobakh-pashev, A. G. (Akademiya Nauk SSSR, Novosibirsk, Institut Yadernoi Fiziki). Translated by T. Watt for Stanford Linear Accelerator Center, Calif., from Russian Preprint No. 327. 12p. Dep. CFSTI.

The results are reported of a preliminary analysis of approximately 100,000 photographs from a spark-chamber study of the  $\rho$ -meson, using the electron-positron storage ring VEPP-2. The measurements were carried out for nine energy values between 508 and 514 MeV. Two types of events were analyzed: elastic electron-positron scattering and charged kaon pair production. A least-squares fit of the results to the Breit-Wigner curve yielded the following values for the resonance parameters:  $\Gamma = 4.1 \pm 0.5$  MeV and  $\sigma_0 = 2.3 \pm 0.3 \mu b$ . The total resonance cross section for the formation of the  $\rho$ -meson was found to be  $\sigma_p = 4.8 \pm 0.6 \mu b$ . (L.B.S.)

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Devices

USSR

UDC: 621.376.4(088.8)

SINITSYN, Yu. S., PESTOVA, L. P.

"A Phase Detector"

USSR Author's Certificate No 263690, filed 18 Nov 67, published 25 Jun 70  
(from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12D80 P)

Translation: This Author's Certificate introduces a phase detector made in a bridge circuit and containing transistor switches in two adjacent arms with collectors and bases respectively interconnected and reference voltage applied between the bases and collectors of the transistors from the secondary winding of a transformer. To reduce the systematic component of imbalance in the voltage across the output of the detector when there is a high level of interference at the input, the emitters of the switch transistors are connected in the bridge circuit through commutators which continuously reverse the mutual location of the transistors in the limits of each arm at a frequency lower than that of the input signal.

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USSR

UDC 541.183.12

PESTRAK, A. E., and SOLDATOV, V. S., Institute of General and Inorganic Chemistry, Academy of Sciences Belorussian SSR

"The Effect of the Degree of Cross-Linking of Ion Exchangers on the Selectivity of Ion Exchange"

Minsk, Vestsi Akademii Navuk BSSR, Seryya Khimichesknykh Navuk, No 5, 1971, pp 127-129

**Abstract:** The effects of the degree of cross-linking of Dowex-50 ion-exchangers with 1, 4, 8, and 12% divinylbenzene on the selectivity of ion exchange in the processes  $\text{Ca}^{2+} - \text{Ag}^+$ ,  $\text{Ca}^{2+} - \text{K}^+$ ,  $\text{Ca}^{2+} - \text{H}^+$  were studied. It was established that the degree of cross-linking affected the selectivity in a different manner in each of the three systems in question. This was due to the combined effect of two factors, the apparent equilibrium constant and the normality referred to weight in the exchanger phase. The results showed that there is no single rule for the relation between the degree of cross-linking of an ion exchanger and the selectivity.

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1/2 015 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--POLAROGRAPHIC DETERMINATION OF 2-ISOPROPYLNAPHTHALENE OXIDATION  
PRODUCTS -U-  
AUTHOR-(02)-PESTRETSOVA, T.A., KIRICHENKO, G.N.  
COUNTRY OF INFO--USSR  
SOURCE--ZAVOD. LAB. 1970, 36(3), 267-9  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--POLAROGRAPHIC ANALYSIS, NAPHTHALENE, HYDROPEROXIDE, KETONE,  
ORGANIC PEROXIDE, DROPPING MERCURY ELECTRODE, OXIDATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3004/1962 STEP NO--UR/0032/70/036/003/0267/0269  
CIRC ACCESSION NO--AP0132223  
UNCLASSIFIED

2/2 015

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0132223

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POLAROGRAPHIC METHOD FOR THE SIMULTANEOUS DETN. OF THE OXIDN. PRODUCTS OF 2-ISOPROPYLNAPHTHALENE, I.E. 2-ISOPROPYLNAPHTHALENE HYDROPEROXIDE (I), METHYL 2-NAPHTHYL KETONE (II), AND BIS(2-ISOPROPYLNAPHTHALENE) PEROXIDE (III) IS DESCRIBED. TO DET. I AND II, 0.5 ML OF THEIR 0.2-0.5PERCENT SOLN. IN 2:1 C SUB6 H SUB6-ETOH WAS DEAERATED WITH H<sub>2</sub>, 4.5 ML OF 0.3N LiClO<sub>4</sub> SUB4 IN THE SAME SOLVENT MIXT. WAS ADDED, AND THE SOLN. DEAERATED AGAIN FOR 2 MIN. DROPPING HG ELECTRODE AND THE HG POOL ELECTRODE WERE USED. BOTH I AND II GAVE 1 WAVE AT MINUS 0.85 AND MINUS 1.70 V, RESP. THE SENSITIVITY OF DETN. OF I AND II IN THE OXIDN. MIXT. (WHERE THE LIMITING AMTS. OF I AND II WERE 40 AND 10 WT. PERCENT, RESP.) WAS 2 AND 0.8PERCENT, RESP. IN 0.05 N BU SUB4 NI IN HCONME SUB2, I, II, AND III WERE REDUCED AT MINUS 1.40 V. THE HEIGHTS OF THE WAVES, CORRESPONDING IN THIS ELECTROLYTE TO THE AMTS. OF I AND II, DETD. IN LiClO<sub>4</sub> SUB4, WERE SUBTRACTED FROM THE TOTAL HEIGHT OF WAVE. THE SENSITIVITY OF DETN. OF III IN THE REACTION MIXT. WAS 1PERCENT (MAX. CONTENT OF III WAS 37PERCENT). FACILITY: NII NEFTEKHIM. PROIZVOD., USSR.

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